FIG. 1.—THE VILLA D'ESTE, TIVOLI. GENERAL VIEW

Pirro Ligorio of Naples, Rome and Ferrara

BY C. A. HARDING [*A.*].

PIRRO LIGORIO came to Rome from Naples when about twenty years of age. His early years are curiously obscure and the meagre facts are contradictory. There are many brief notices of him in biographical dictionaries, but they give various dates beginning with 1490 as the year of his birth, while Lanciani places the event as late as 1527. As there is evidence in Ligorio's writings that he was in Rome between the end of 1540 and 1541, it would seem that about 1520 would be more correct. He came of noble family,* and his early studies were directed to literature, but a gift for drawing led him to seek his fortune as a painter, and in many of his writings he styles himself "Pittore Napolitano." On his arrival in Rome he seems to have supported himself by painting for some years, and in 1542 it is recorded that he painted some frescoes in the Roman Palazzo of Francisco della Rovere, Archbishop of Benevento.

Of his masters in Rome we know little. Bryant, in his *Dictionary of Painters*, says that Ligorio was a pupil of Giulio Romano, but, as Giulio left Rome in 1520–21 to spend his life in the service of the Ducal House of Mantua, this cannot be correct.

Inigo Triggs, in *The Art of Garden Design in Italy*,† refers to Ligorio as a pupil of Vignola, a not improbable suggestion as Vignola returned from France in 1545, and in the following year, under the general direction of Michaelangelo, commenced work upon the courtyard of the Farnese Palace. Ligorio may have received part of his training under Vignola, for among the drawings in the Bodleian Library‡ there is a careful rendering in brown ink of this courtyard, as executed, with the carving alone omitted, and this may be a study of his master's work. Moreover, as will be seen later, Ligorio worked in close association with Vignola for many years on St. Peter's.

Ligorio gained some reputation as an artist, and traces of his work were to be seen, according to some writers at the beginning of last century, in the decorations of several houses in the Campo Marzio, Monte San Silvestro and the Campo dei Fiore, and the same authorities state that these paintings are distinguished by a predominance of yellow in the ground colour.

* Described as "Nobile del Seggio di Porta Nuova," in the *Dictionary of Architecture*, Ligorio himself signs a letter "Patricio Napolitano et Cittadino Romano."

† *Op. cit.*, p. 125. ‡ *Canonici MSS.*, 138.

Ligorio also found time to gratify his interest in the antiquities of Rome, and the destruction of the city provided him for many years with materials in such profusion that he was unable to complete more than rough notes before each new find was destroyed. During the twenty-eight years he spent in Rome many of the finest monuments were sacrificed by the cupidity of the Papal authorities, and Lanciani has related, in the pages of his *Destruction of Ancient Rome*, how all classes of Roman society, popes, cardinals, patricians, and wealthy business men scrambled for permits to procure materials from the buildings of the Roman Emperors.

In 1549 Ligorio painted two frescoes in the Oratory of S. Giovanni Decollato* near San Giorgio in Velabro. The design of the church of S. Giovanni has been credited to Ligorio, but as Francesco Salviati had, according to Vasari, been painting in the church in 1538, this is a mistake. Francesco was again at work in the building at the same time as Ligorio, and Vasari painted the picture over the high altar, which were not fixed until 1553, though the commission was given some considerable time before. In view of the relations between Ligorio, Salviati and Vasari in after years, the first contact between the three men is of interest.

About this time the little church of S. Giacomo e Martino was erected and may have been designed by Ligorio. It was, in 1563, restored and rededicated as S. Eligio dei Ferrari.

Ligorio now abandoned painting as a means of livelihood, and in the latter part of 1549 entered the service of Ippolito d'Este, Cardinal of Ferrara, at a salary of 7 scudi 53 baiocchi per month.

The Cardinal was keenly interested in the arts, both ancient and modern, of his country, and his collection of classic sculpture was world-famed.† In 1549 he was appointed Governor of Tivoli by Pope Paul III, and instructed Ligorio, who seems to have been engaged primarily on the strength of his antiquarian knowledge, to prepare designs for a country seat near the famous ruins of Hadrian's Villa on the banks of the Anio. According to Percier a villa had been commenced on the chosen site nine years before by Cardinal Barthelini della Cueva d'Albuquerque, Bishop of Cordova, but in comparison with the splendid creation of Ligorio it was a modest undertaking.

Ligorio at once set to work, and while preparing the site laid bare the remains of a Roman villa—that of Quintilius Varus—and in extending the area for his patron he demolished some of the eastern part of the town of Tivoli. It has been stated that, in all, one million scudi were spent in the preparation of the ground. Hadrian's Villa was laid under contribution for materials and for motifs in design, and, at the same time, Ligorio contrived to make a survey of the two villas and to prepare partial restorations dedicated to the Cardinal, which were a great advance upon the crude representation of topographical plans usual at the time.

The site of the Villa d'Este falls steeply from the south and the great mass of the Casino on the heights looks over the terraced gardens, beautiful even in their present neglect, but in the great days of the Cardinal far-famed and a wonder to travellers (Fig. 1). The building itself, intended as a summer residence for the Cardinal and his suite, numbering 250 persons not including servants, is a vast rectangular mass, almost devoid of architectural features save for the outside stairways to the principal doorway on the Piano Nobile. It is nearly 300 feet in length and is continued by lower terrace walls enclosing the private gardens and service courts along the whole of the south end of the site. An engraving by Du Perac published in 1573 shows belvedere above the main cornice carrying up the lines of the projecting end features of the façade, but it is doubtful if these were ever seriously contemplated.‡ The interior is decorated with frescoed walls and vaulted ceilings, painted mainly by the brothers Zucchero, Taddeo and Frederigo. A species of incrustation of shells and pebbles, very much affected at the time, was largely used in the arabesques in the Casino as well as in the interiors of the many grottoes and fountains in the grounds.

In front of the Casino is a wide terrace which leads through formal gardens to the Terrace of the Fountains, some 500 feet long. At the eastern end is the Fountain of Arethusa and a Bath House, and at the western extremity the architect's love of the antique caused him to construct a curious model of Old Rome, now much mutilated but still interesting. It is rather a fanciful suggestion of Ligorio's than an attempt at detailed reproduction, and a pleasing transcript of the Island of Aesculapius stands in front, washed by a stream diverted from the Anio near by. Many other fountains of varied design, all with classical§ names, and grottoes enshrining marbles from the Cardinal's collection, show the fertility of Ligorio's invention and his freedom in adapting classical details to the needs of the moment. Terraces with ilex, cypress and laurel lead down to the kitchen gardens and entrance, and from many a vantage-point on the boundary walks superb views of the Campagna are obtained.

The Villa d'Este, the first authentic work of Ligorio as an architect, has exercised a never failing fascination on artists and writers, and has found expression in the many fine drawings and descriptions of such writers as Evelyn and Montaigne. In the gardens Ligorio was

* Belonging to the Fraternity of the Misericordia. The plan and section are given in Letarouilly's *Rome Moderne*, pl. 171.

† A detailed description of the sculptures and some interesting reproductions of old views of the villa are to be found in a paper by Dr. Thomas Ashby in *Archæologia*, vol. lxi.

‡ Dr. Ashby, in reproducing the view (*op. cit.*), points out that the gardens were treated in a spirit of anticipation (which may have been extended to the building).

§ *E.g.*, Thetis, Hygeia, Flora, Pomona, and even Venus Cloacina !

assisted by Giacomo della Porta, whilst the hydraulic work was entrusted to the celebrated engineer Orazio Olivieri, to whom must be attributed the tasteless water-organ.

In 1555 Cardinal Giovanni Pietro Caraffa, a Neapolitan, was elected Pope, taking the name of Paul IV, and Ligorio was shortly afterwards invited to enter the Papal service, being associated, as far as the work at the Vatican Palace was concerned, with Sallustio Peruzzi, the son of Baldassare.

The great church of St. Peter's was now in the hands of Michaelangelo, and, in conjunction with Vignola, Ligorio was employed upon the fabric, but, failing to agree with Michaelangelo, he was withdrawn.* According to Letarouilly, there is among the Vatican archives a project for the restoration of the Thermae of Diocletian, dated 1558, by Ligorio, but this building was five years later reconstructed by Michaelangelo, who adapted a portion of the famous ruin for use as a monastery and the remainder as the church of S. Maria degli Angeli. A further drastic restoration at the hands of Vanvitelli was effected in 1749.

Ligorio and Peruzzi were now busied with the completion of Baldassare Peruzzi's courtyard of the Belvedere, and this, with the Gran' Nicchione, which forms such a magnificent feature in the Giardino della Pigna, was finished in the reign of the succeeding Pope.

Ligorio was instructed to prepare designs for a Casino in the wood of the Belvedere, and the charming little building now known as the Casino Pio Quarto or the Villa Pia was commenced (Figs. 2 and 3).

The original design for the gardens, scarcely completed, was due to San Gallo, and Ligorio arranged his composition on a hillside sloping to the north-west. On the southern or higher side of an oval courtyard is a small Casino whither the Pontiff was wont to resort to escape the etiquette of the Papal Court, and on the opposite side is an open loggia. At the ends of the court are two arched porches, and from the ground outside two curved ramps lead down to the lower parterre, which contains a fishpond and adjoins a level green forming part of San Gallo's design. Much of the material came from the Stadium of Domitian, and the work was hurried forward only to be interrupted by the death of Paul IV, which occurred in 1559.

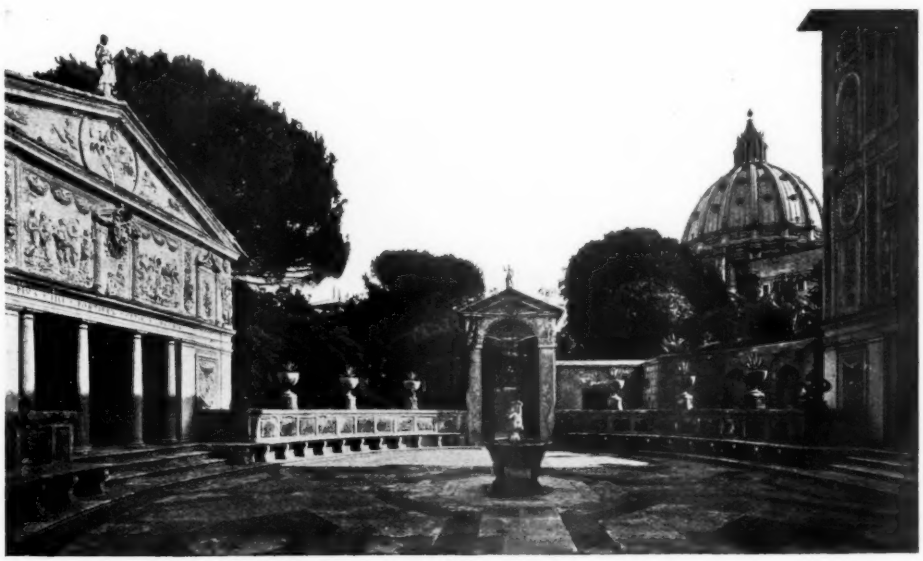

FIG. 2.—VILLA PIA. THE COURTYARD AND THE LOGGIA

The new Pope, Pius IV, at once resumed the work. Salustio Peruzzi assisted in the general supervision, and the superintendent of works was Bernardino Manfredi, who had as foreman under him one Francisco da Como ; the stucco work, or " grotteschi," was mostly executed by Rocca di Montefiascone. The

* Ligorio and Vignola were employed to supervise work that could not be reached except by ladders. See Prof. Aitcheson, *R.A. Lectures*, 1901.

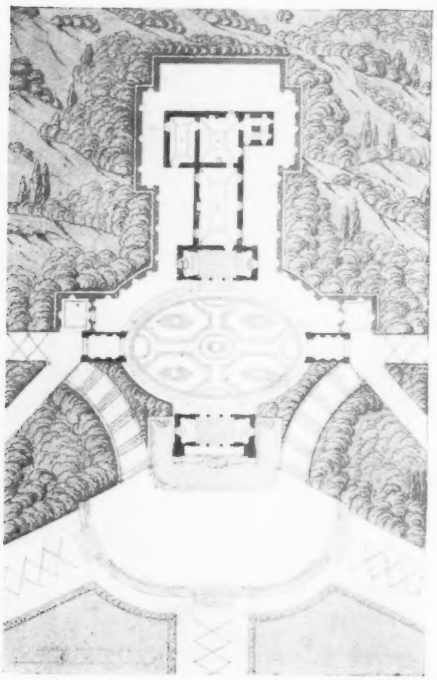

FIG. 3.—VILLA PIA. GENERAL PLAN
From Bouchet and Lochette

painters are mentioned at length by Vasari in the *Life of Taddeo Zucchero*. There were Frederigo Barocchi, who, assisted by Leonardo Cungi and Durante del Nero, both from Borgo San Sepulcro, executed the paintings in the first floor rooms of the Casino ; Santi Titi, of Florence, who painted the room above the staircase ; Frederigo Zucchero, who was responsible for the principal apartment and also for the Loggia across the courtyard ; Giovanni dal Carso, who, besides assisting with some of the stucco work, decorated a small room on the first floor, whilst Taddeo himself and Orazio Sammachini and Lorenzo Costa contributed panel paintings in the general scheme. The direction of the works and the selection and payment of the artists were entrusted to Cardinal Emulio, who was, in quite a modern manner, decorated by the grateful Pontiff on the completion of the building.

In spite of considerable ill-usage, the Villa Pia stands to-day fresh and sparkling, under the vast dome of St. Peter's ; a delightful contrast exhibiting the diverse architectural tendencies of the age. It has been the fashion to write of the Villa Pia as an adaptation of the villas of the Romans, but Ligorio has refined the materials drawn from his study of ancient art, and in an exceedingly small space he has produced an architectural work of the greatest interest.

In the year 1560, Ligorio, assisted by Peruzzi, made a restoration of part of the church of Ara Coeli, and in the same year the Lancelotti Palace in the Piazza Navona was commenced. According to Falda this building was designed by Ligorio. Leon Palustre,* however, describing the building as one that would add nothing to his reputation, rejects the attribution. The façade, though severe, is not dissimilar in type to one shown among the drawings in the Bodleian, and may well be by Ligorio.†

About this time it would appear that he was entrusted with the completion of the Sala Regia ‡ at the Vatican. During the progress of the work, Ligorio, who seems to have been greatly in favour with Cardinal Emulio, was approached by Salviati, to obtain for him, in conjunction with Daniello da Volterra,§ some portion of the decoration of the Sala. As a result of the architect's petition, supported by Daniello, Salviati, who was, even in the partisan view of his friend and biographer Vasari, a bad-tempered man, obtained employment and proceeded to obliterate one of Volterra's paintings. Vasari reports the result in the following words : " But Salviati, paying no regard to Piero, any more than to the others, . . . caused the architect from having been his friend to become in a certain sort his enemy." Ligorio eventually succeeded in taking the work out of Salviati's hands, who, incensed, left Rome in disgust.

The Sala Ducale also has been attributed to Ligorio and Peruzzi, but later restoration at the hand of Bernini has obliterated the original features.

Other works at the Vatican during the time of Paul IV and Pius IV were probably under the general supervision of the two officials, following the original designs by other architects.

Ligorio devoted some time to works of engineering and public utility. The harbours at Porto were surveyed, and in 1562 he was engaged in repairing the seawall and defence works at Citta Vecchia, and there are some sketches in the Bodleian of his proposals, dated September of that year. In 1563 Ligorio undertook some extensive work at the Basilica of St. John Lateran; including the restoration of the side wall, and his work is still to be seen above the north porch erected by Fontana (Fig. 4). It consisted of a high wall and two bell towers connected by a balustrade, a segmental pediment

* *L'Architecture de la Renaissance.*

† *Op. cit.*, fol. 107.

‡ Commenced by San Gallo, frescoes by Pierino del Vaga, and left unfinished at his death in 1547.

§ Daniello Riccarielli, the " breeches maker " of Michaelangelo's *Last Judgment*. He was a close friend of Ligorio, and his name appears in a partly defaced note in the Bodleian MSS., fol. 97.

and panels for the arms of the Pope. The wooden ceiling of the nave was also commenced for Pius IV and completed by Pius V. The nave itself was drastically remodelled by Borromini, and the balustrade was taken down by Fontana when he was building the arcaded porch.

Ligorio carried out some repairs to the Acqua Vergine, better known to visitors to Rome as the Fontana di Trevi, and simultaneously the building on the Via Flaminia, known as the Vigna of Pope Julius, was completed. The structure was commenced either by Peruzzi or San Gallo, but was only partially finished. Pius IV, at his accession, found it rapidly falling into ruin and decided to adapt it as a resting-place for princes temporal and spiritual travelling to Rome. From the evidence of the building, substantiated to some extent by tradition, it would appear that Ligorio and Peruzzi again collaborated, the lower stage being by the latter, but the delicate and fanciful composition at the angle was no doubt due to Ligorio (Fig. 5).

FIG. 4.—S. GIOVANNI IN LATERANO
Ligorio's work above north porch

In the following year (1564) Michaelangelo died and Pirro Ligorio and Vignola were appointed architects to the fabric of St. Peter's at a joint salary of three hundred ducats per annum. They appear, however to have done little beyond the travertine facing to some of the walls.

In 1565 Ligorio, whose temperament seems to have been somewhat uncertain, had a disagreement with Fra Guglielmo della Porta, of whom he complains bitterly in a letter to the Cardinal Farnese, now the colleague of Cardinal Emulio in the administration of the works at the Vatican. In the same year Pius IV died, and was succeeded by Michele Ghislieri, who took the title of Pius V.

The new Pope had been created Bishop of Neri by Paul III, and one of his first acts on ascending the throne was to erect a tomb in the Church of S.M. Sopra Minerva to the memory of his patron. This was designed by Ligorio and executed by Jacopo and Tomaso Casignuola. Antique marbles were supplied for the sculptures and the work was finished in 1566.

About this time Ligorio was consulted about some repairs to the Sistine Chapel, and in the Bodleian* there is a drawing showing his proposals for remedying the damage caused by the unbuttressed vault, built in 1473, and now threatening to overturn the walls and destroy the paintings of Michaelangelo and other

* *Op. cit.*, fol. 106.

masters. The drawing shows the system of shoring and of underpinning the walls, and describes the proposed piers projecting from the face of the old walls, urging the importance of prompt attention to the condition of the fabric.

In 1566, at the instance, it would seem, of Vasari, Ligorio was dismissed from the papal service for proposing to vary the designs of Michaelangelo. Vasari also lays upon Ligorio the responsibility for the collapse of the Ponte Sisto, which occurred in 1567. This was unfounded, as Vasari should have known, for a commission had been sitting since the August of 1565, and some months afterwards Vignola had been appointed architect, but Papal parsimony had prevented any steps being taken for the safety of the structure.

Ligorio now returned to the service of the Cardinal of Ferrara, his first patron, who, returning to Italy after the murder of the Duc de Guise, and being out of favour with the new Pope, had retired to Tivoli, where, amidst his rare collections and in his still unfinished villa, he passed the remainder of his life. The completion of the great gardens now occupied the attention of Ligorio for some months, and he was then brought to the notice of the Cardinal's nephew, the liberal-minded Alphonso II, Duke of Ferrara.

Alphonso had been educated in France, and on his succession he determined to revive the glories of the house of Este, and to make his court once more a centre of Humanist culture. To this end he was rebuilding his palace and gathering around him workers in the arts and in literature, among whom Ligorio was included. In 1568, therefore, Ligorio took up an appointment as engineer and architect to the Duke at a salary of 25 golden crowns per month, and left Rome for ever. While in Ferrara Ligorio married, but had no children.

In 1570 an earthquake caused the River Po to inundate its banks, and the constructive skill of the ducal architect was severely tested in the necessary repairs to fortifications and buildings.

He also prosecuted his researches in the past remains of his country and assisted Enea Vico to classify the ancestral collections of the Duke.

Ligorio also found time to continue his own work on the antiquities of the Roman Empire, and to rearrange his notes, and he was as indefatigable as ever in his efforts to obtain fuller information and corresponded with many of the foremost antiquaries of the day. Among these was Julius Orsini, and there is a curious letter extant, dated 1577, requesting information about some inscriptions of the Fratres Arvales, which had been discovered about three years after Ligorio had left Rome. This letter is signed "Pirro Ligorio. Romano!" * Another letter, now in the Bodleian,† was written from Ferrara to Ercole Basso, of that city, regarding a medal of the Emperor Commodus, and is dated 1581. Professor Middleton,‡ endeavouring to prove that Ligorio was alive after 1580, the date given by Milizia,§ read the figure as 1585, but a careful examination of the MS. shows that the last inclined stroke in the Roman numerals, making the "I" into "V," has been added in a different ink, and, presumably, at some subsequent date.

About the date of his death, like his birth, there existed until recently many diverse statements. Bryan asserts that Ligorio died in 1573, Milizia as stated above, and several other writers following him give the date as 1580. Lanzi, however, placed the event in 1583 and Begni ‖ is able to confirm this and to add the month of October.

Pirro Ligorio left a prodigious amount of manuscript and sketches, and Vossius alleges that he saw 120 volumes. They all passed into the possession of his nephews, and later into the libraries of two Ferrarese gentlemen, Signori Gardellini and Crispi, after which the collection was broken up, the greater portion having been secured by the Duke of Savoy for the famous Royal Library at Turin at a cost of 18,000 crowns. This comprises thirty folio volumes of manuscripts and sketches. There are ten volumes apparently copied from the Turin MSS., in the Museum at Naples. Two volumes are now in the Vatican Library, and there is one volume at the Bibliothèque National at Paris, and another at the Bodleian Library at Oxford, while there are a few sketches in the Royal Library at Windsor.

These represent the labours of twenty-eight years, principally in Rome, though other parts of Italy are represented, and were intended to form an *Archæological Dictionary and Cyclopædia*, divided into several books. The whole conception was far in advance of the usual type of such works in Ligorio's day. The illustrations, as will be seen on inspection of any of the MSS. or even of the reproductions to be found in the published works of modern archæologists,¶ are drawings of considerable power, and are mostly in brown ink. The manuscript varies considerably, part being written in neat Italian script with finely drawn initial letters, which appears to be the final form of the portions so treated, while the remainder seems to be drafts in various stages of completeness and includes rough notes on odd scraps of paper. In some of the volumes drawings of architectural detail and composition are interspersed which vary so much in draughtsmanship and design that the student is forced to reject much as unworthy of the talented Neapolitan architect.

His published works are few and mostly in the

* Reproduced by P. de Nolhac in the *Bibliothèque de l'Ecole des Hautes Etudes*, 1887.

† *Canonici MSS.*, fol. 1 *et seq.*

‡ *Archæologia*, vol. li, pp. 490 *et seq.*

§ *Memori degli Archetti*, Parma, 1781.

‖ *The Vatican, its History and Treasures*, New York.

¶ *E.g.*, Lanciani and Middleton.

volumes of other authors issued after his death. Amongst these is the plan of the Villa Hadriana restored by Pirro Ligorio, first undertaken for the Cardinal d'Este, and printed in 1634, at the direction of Cardinal Antonio Barberini, who instructed his architect, Contini, to bring the plan up to date. Contini, however, seems to have contented himself with publishing Ligorio's plate with the text in Latin, merely describing the identification letters. Poleni (Vol. V) gives a description of the Amphitheatre of Verona by Ligorio ; and a treatise on the vehicles of the ancients

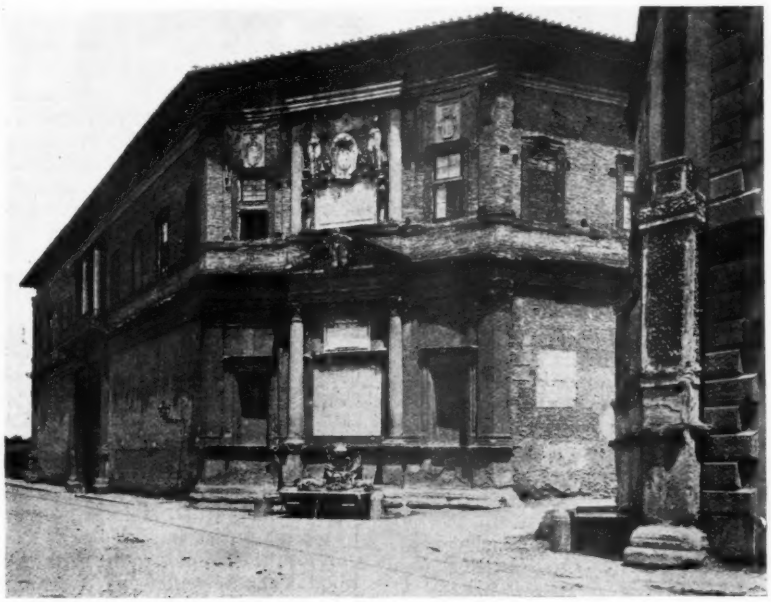

FIG. 5.—THE VIGNA OF POPE JULIUS

was published in Frankfort in 1671, under the title of *De Re Vehiculari*. In the two *Thesauri* of Graevius there are descriptions of the Villa Hadriana and Villa d'Este at Tivoli, both from the pen of Ligorio. There were in addition drawings of the Circus Maximus and maps of Italy, Naples and Greece, but on the manuscript volumes rests his archæological reputation. There are three manuscript volumes on Rome and the Campagna, dedicated, the first to Cardinal Ippolito d'Este, the second to Cardinal Alessandro Farnese, and the third to the Holy Trinity, and there is the great cyclopædia already referred to.

The value of this mass of information has been much debated. For instance, Lanciani * describes the author thus : " Unfortunately he was not born to speak the truth ; he was a born impostor and forger, so that it is always difficult and sometimes impossible to decide whether his evidence, when unsupported by more trustworthy witnesses, rests on any foundation of truth . . ." But a few sentences after he adds: " I have myself found so much useful and honest information in Ligorio's manuscript volumes . . . that I cannot bring myself to brand him with the stigma." Professor Middleton, writing in *Archæologia*, has also testified to their value.† The same uncertainty exists with other of Ligorio's critics. Ludovico Muratori, in his *Thesaurus*, speaks bitterly of his want of faith. Oliviera wrote a long monograph on the frauds of Ligorio, whilst Dr. Borghese, quoted in the *Nouvelle Biographie*, says, referring to a suggestion of investigating the ambiguities of Ligorio : " When your project is complete you will be surprised at the number of apocryphal monuments caused by this man." Other writers of less erudition and greater imagination have charged Ligorio with systematic fabrication of false antiquities, coins and medals.

Ligorio in some of his notes confesses that he was unable to vouch for the correctness of his surveys, and he is unsparing in his condemnation of much of the de-

* *Wanderings in the Roman Campagna.*

† *Op. cit.*

struction that he witnessed. Moreover, the MSS. that remain are not complete, and on that ground he is entitled at least to a recommendation to mercy. Mistakes there undoubtedly are, but Ligorio was not alone in these. Palladio, for instance, in a drawing in the Burlington-Devonshire collection, mistakes the Palace of Augustus for a public bath, while Lanciani * gives an illustration of the Regia drawn by Ligorio, and says: "Evidently the latter was under the impression that the building was the Arch of Janus." This must have been one of Ligorio's earliest drawings, as the discovery took place in 1543. Lanciani admits that many of the particulars are genuine and bear comparison with the existing fragments.

Raoul Lochette † has probably supplied the true explanation when he suggests that during the feverish exploration that was carried on in the sixteenth century Ligorio made his sketches in haste, and the lacunæ which occurred would not be filled until the leisure of his later years, when at Ferrara, rewriting and redrawing his material, he would add to and alter his work from memory, the particular relic by that time being probably destroyed.‡ There is evidence in the letters referred to above of his efforts to obtain further information, even after he had left Rome for good.

Apart from Ligorio's place as a pioneer in epigraphy, there can be no serious difference of opinion on his architectural achievements, though there is little contemporary notice of him.

Vasari came into contact with Ligorio, as we have seen, early in the latter's career, but to Vasari one man towered over the world of art; hence, when Ligorio dared to express his views of Michaelangelo's work at St. Peter's, he became to him an object of detestation. There was, in addition, the dismissal of Salviati, related above, to add to the resentment shown in the fact that no life of Ligorio appears in the *Vite*, and any references that Vasari felt necessary were so brief as to imply that the performances to which they relate were unworthy of extended notice. Vignola, the close associate for many years of Ligorio, was the object of a similar display of feeling on Vasari's part,§ and for a like reason—namely, the marked influence that Vignola and his friends gained over Julius III to the detriment of Michaelangelo.

In his private letters Vasari was more outspoken, and often careless of his facts. Of this Mr. R. W. Carden gives a good instance in his biography, where in a letter dated 1566, to his friend Vincenzio Borghini, Vasari says: "I have received orders to examine the substructure of the Ponte Sisto, which is in a dangerous state; also the works at St. Peter's from which Pirro has just been dismissed, though not before he has made, I don't know how many mistakes." The mistakes would appear to be departures from Michaelangelo's designs, for Ligorio was not in any way likely to fail in either design or construction, and his reputed connection with the Ponte Sisto was, as pointed out above, untrue.

Ligorio's fame as an architect needs no more than the Villa d'Este or the Villa Pia to show that he was a worthy descendant of the great artists who had made Rome the centre of culture. Upon such men scholarship sat lightly. Antique forms, eagerly studied, were adapted and recast as fancy dictated. The pedantry that was later to fetter architecture was as yet undreamed of.

In the buildings of Ligorio, though their designer was probably better versed in the details of Roman architecture than any other man of his day, there is no suggestion that he ever attempted to seek for rules. His skill in construction, and a fine selective capacity in design, combined to give the building the impress of the social life of his day.

Like all his contemporaries he was a man of many occupations—artist, architect, engineer and antiquary by turns; but as an architect he will ever rank high, if only for the examples on the banks of the Anio and in the wood of the Belvedere, where art and nature have been blended in perfect harmony by this almost unknown artist-archæologist who has been described as "the most genial artist of his time." ||

* *Ruins of Ancient Rome.*

† Bouchet and Lochette, *Villa Pia.*

‡ Ligorio himself, while he protests against the destruction of some of the finds, says (*Canonici MSS.*, fol. 19), speaking of Roman stucco, "Take three parts of pounded Parian marble, easily got from among the Ruins of Rome and from broken Statues."

§ It is true that there is a notice of Vignola in the *Life of Taddeo Zucchero*, but only because the architect of the Palace of Caprarola seemed to require some brief notice. The paintings of Taddeo are described in full.

|| Lanciani, *Wanderings in the Roman Campagna.*

The Acoustics of the Auditorium—Part II*

BY G. A. SUTHERLAND, M.A.

WE have seen that some reverberation, particularly in large halls and in the case of orchestral music, is very desirable in order to give the necessary fullness of tone, and the incompatible demands of speech and music in this respect might seem to make it impossible to design a large hall which would be satisfactory for both speech and music. The problem is certainly a difficult one, and where possible separate rooms should be used for separate functions. If this is impossible there is, fortunately, a solution of the problem which has proved satisfactory in practice, though scientific experiment on the point has not yet been carried out.

We have seen that reverberation and intensity go hand in hand, so that the deadness that characterises music in a hall of fairly small reverberation is due, in part at any rate, to the accompanying small intensity. We have the means of increasing the intensity of the music and giving it fullness of tone by employing the phenomena of forced vibration and resonance. The increase in intensity produced by the forced vibration of a suitable board or soundbox is considerable, but it is very small compared with the increase produced by resonance, as may easily be shown by experiment.

In a room resonance may be of two kinds. The column of air in the room has a natural period of its own, and it will resound readily to a particular note. This is most noticeable in a small empty room such as a bathroom. In a large room the response will in any case be to a much lower note, and is unlikely to occur noticeably except in the case of a building of cruciform shape.

But resonance may also occur by the mechanical vibration of the walls of the room, as was quite clear in considering the absorption curve for wood panelling. It may at first seem surprising that a comparatively good absorber should increase the intensity in the room ; and, to understand this, one has to look into the nature of resonance. If a note is sounded near a wall which tends naturally to vibrate in the same period, the wall absorbs the energy—*i.e.*, it converts it into the mechanical energy of vibration. This wall vibration is, in the first instance, of insufficient amplitude to give an audible sound, but if the note be sustained the energy of the wall will increase sufficiently for it to become a sounding body also. When the note is stopped the wall energy becomes insufficient to produce sound, and the wall acts again merely as an absorber.

So that a resonating body will perform the desirable function of acting both as an increaser of intensity and a decreaser of reverberation. The same will be true of forced vibrations, but in a much less degree.

The resonator will be most effective when placed near the sounding body, and wood panelling should therefore be placed near the orchestra to get the best effect. In any case, it should not be placed too far from the orchestra, otherwise the direct and the resonated sound may reach part of the audience at such an interval of time that an echo or confusion results. Of course, any sound transmitted through the framework of the building will reach the audience practically as soon as the direct sound.

It might seem that a resonator, responding as it does to one particular note, could only produce distortion. Here the difficulty may be met by providing a series of resonators for different notes ; one way in which this might be done would be to arrange for different thicknesses of wood panelling on studding to be placed at varying intervals, which could be arranged to give the same external appearance though resounding to different notes in its different parts ; but here again the results of scientific experiments are still lacking.

In any case, there is always the gain from forced vibration. In particular, a six-inch space under the floor boards of an orchestra pit has in one case been found to produce almost equal reinforcement over the whole scale. And wood panelling in the neighbourhood of an orchestra gives successful results in many different halls.

In this connection it is interesting to note that Vitruvius suggests that theatres constructed of wood, having wooden floors, do not need the system of resonant vases ; while those constructed of rubble, squared stone or marble do.

It has been pointed out that, in an ordinarily shaped room, and in the absence of special circumstances, the effect of an absorbent on reverbation is independent of its location; but this is a far different thing from saying that its effect on the *acoustics* of a room is isdependent of itslocation. Shortness of reverberation is only one desirable factor. The absorbent material must be placed so as to contribute to other desirable factors. Fortunately it can be relied on to reduce the reverberation wherever it is placed. The best location for it in practice depends on the shape of the auditorium.

The principle on which adequate loudness is assured in an ordinary auditorium is so to design the room that no member of the audience receives within one-fifteenth of a second less sound than he would if he were distant less than about 50 feet from the speaker Out of doors in still air it is possible to hear farther than this distance, but in a hall, with a certain amount of

* The 1st part of this article appeared in the JOURNAL of 22 September.

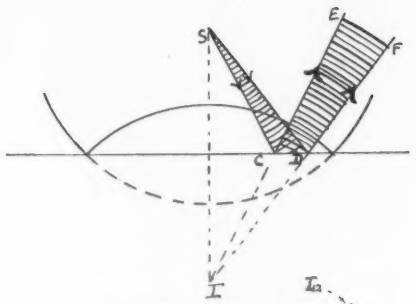

FIG. 11.—Illustrating reflection from a single surface.

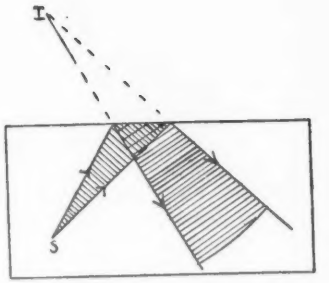

FIG. 12.—Showing the effect of the ceiling in reflecting sound to the rear seats.

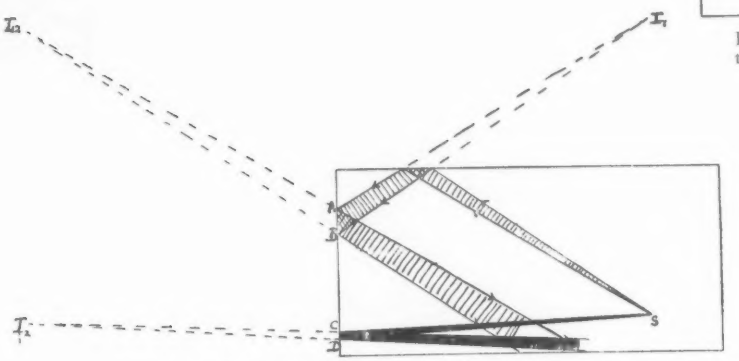

FIG. 17.—Showing long reflected paths tending to produce echoes.

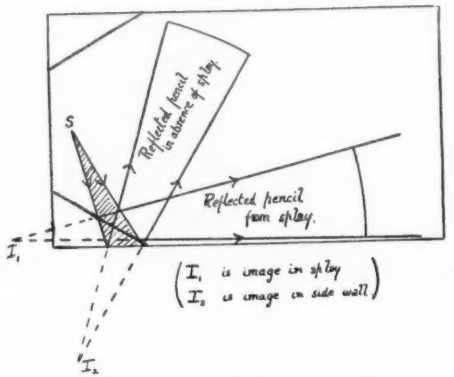

FIG. 13.—Showing the effect of a splay on the side wall in reflecting sound to the rear seats.

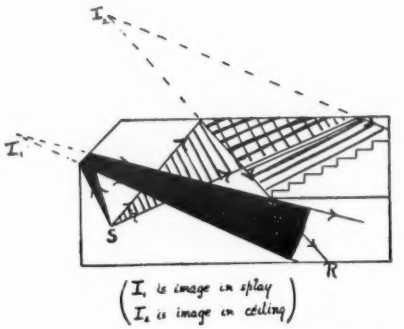

FIG. 14.—Showing the advantage of a ceiling splay for reflecting sound below a gallery.

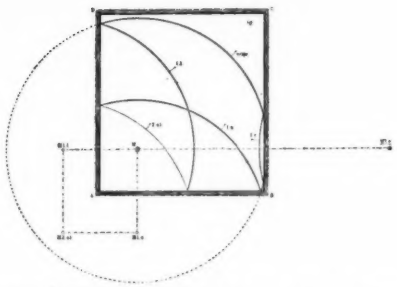

FIG. 15.—Acoustic diagram for a nearly square room with a source of sound, *M*, near one corner.

rustling and similar noises and a longer reverberation, 50 feet is a suitable standard to take. In small halls this presents no difficulty. All that has to be arranged for is that the speaker shall have an uninterrupted view of everyone in the audience, no member of which shall be at a greater distance than 50 feet.

In any room the path of the sound is simply obtained, to a first approximation, by the method of images which will now be explained. If a train of sound waves proceeding from a point S (Fig. 11) strikes a reflecting surface AB, the sound waves, after reflection, proceed as though their origin was not S but I, which is at an equal distance behind the surface on the perpendicular from S. I is called the image of S. If we confine our attention to a portion CD of the wall, then we find the reflected path by joining I to the points CD and producing them to EF as shown. The shaded part shows the progress of the wave.

Where one dimension, the length, is greater than 50 feet, the direct sound must be supplemented in the case of the rear seats by sound reflected from a hard surface. This surface is most conveniently the ceiling, since the upward part of the wave reaches the ceiling without loss. This is illustrated in Fig. 12.

At the same time the splaying of the side walls may be of advantage since it reflects some of the sound to the seats at the back of the room instead of to the front, where it is not required. This will be clear from Fig. 13. The most suitable angle for the splay will be that which confines the reflected sound as far as possible to the part of the room where it is most needed. This will vary for different shapes and sizes, but in any case may be determined from the diagrams.

Where there is a gallery it may be advantageous also to splay the ceiling, since otherwise the ceiling reflection, though reaching the gallery, may not be able to reach the seats at the back of the hall underneath it. This is clearly illustrated in Fig. 14, where the shaded beam represents the flat ceiling reflection to the gallery, and the black beam the reflection from the splay to the seats on the floor. Neglecting the bending that always takes place to some extent, the point R represents the farthest back point to which the sound reflected from the flat ceiling could penetrate.

In any case, it will be possible, by applying this acoustic diagram method, so to design the building as to ensure sufficient loudness everywhere in the room. The diagram method may be employed more completely than we have yet done to investigate the progress of a sound wave. As an example of this, we may take the case of a nearly square room with the source near the corner, as shown in Fig. 15, where the complete wave system for a single wave is drawn at a particular instant of its progress. That this does give us a true picture of wave motion in simple cases may be seen from the photograph 8 of Fig. 16, the photographs being of water waves at about one-tenth second intervals in a similar vessel with a source near the corner.

The loudness at any point of a room may be calculated by applying the inverse square law. If I is the intensity of the direct sound at a distance of 50 feet, then the intensity of the direct beam at any distance, d, is $\frac{I\ 50^2}{d^2}$. If the sound suffers reflection then it is diminished in the ratio of the reflection coefficient R of the

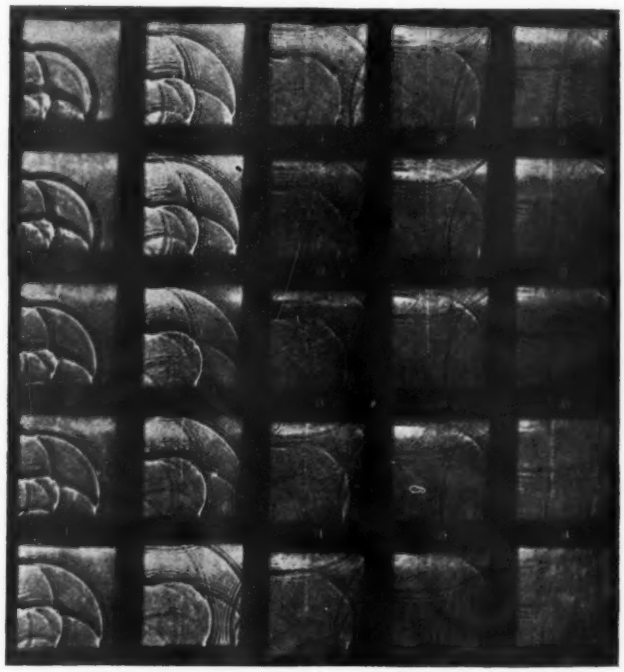

FIG. 16.—Photographs at one-tenth second intervals of water waves emanating from a point near one corner in a vessel of the same shape as the room represented in Fig. 15.

surface it strikes, the reflection coefficient being given by 1–A, where A is the absorption coefficient. The formula for intensity at a point after one reflection is thus : $\frac{R_1 I\ 50^2}{d_1^2}$ where d_1 is the distance of the point from the image I_1 in the surface considered. If there are two reflections, then the formula is $\frac{R_1 R_2 I\ 50^2}{d_{12}^2}$ where d_{12} is the distance of the point from I_{12} the image of I_1 in the second surface.

Thus the total intensity at any point will be :—

$$I \times 50^2 \left(\frac{1}{d^2} + \frac{R_1}{d_1^2} + \frac{R_2}{d_2^2} + \text{- - -} + \frac{R_1 R_2}{d_{12}^2} + \text{- - -} \right)$$

This will be adequate if it is at least equal to I.

The acoustic diagram not only gives information with regard to loudness, it also shows what over long reflecting paths, which would produce echoes, are to be expected. These can then be eliminated by the suitable disposition of absorbent material. Examples of mischievous reflecting surfaces are shown in Fig. 17. Highly absorbent material should thus be placed at AB and CD. It may be remarked that the rear surface is usually a suitable place for absorbent material.

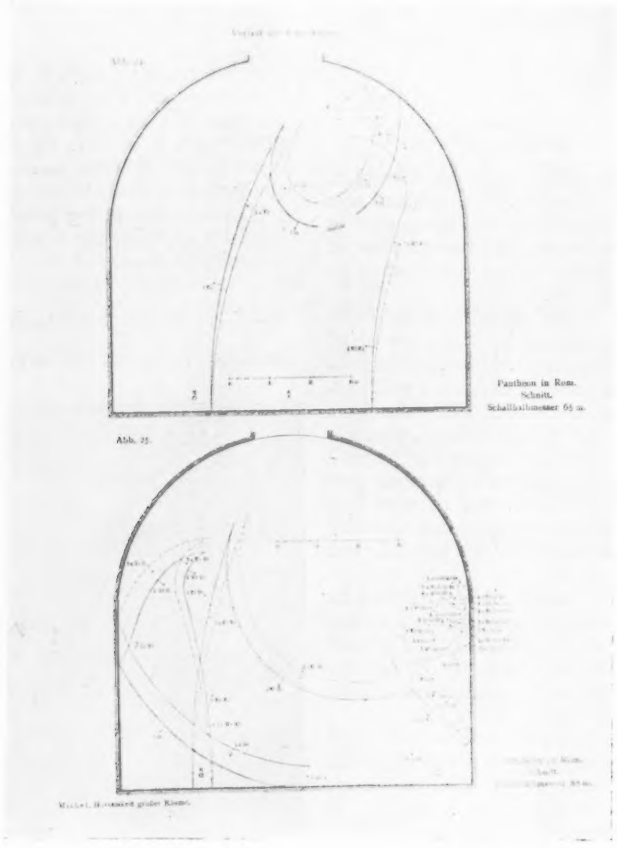

FIG. 18.—Acoustic diagrams for the Pantheon in Rome.

The diagram may also be used to investigate the effects of curved walls, and the bending of sound that will take place round pillars, beams and similar obstacles. Its application here, however, ceases to be simple, and cannot usefully be discussed in this article. That it does give the true form of the waves from a curved surface may be seen by comparing Figs. 18 and 19. Fig. 18 is the diagram for the Pantheon at Rome,

the source being at M. Fig. 19 is a series of photographs of water waves in a vessel of this shape. The shape of the wave at the appropriate instant is seen in photographs 21 and 22 to be the same as that on the diagram. From the diagram it is possible to predict that a listener at A will hear four distinct echoes having intensities roughly of 0·9, 0·6, 0·5, 0·9 of the original sound respectively.

Where, owing to the presence of many curves and irregularities, the diagram is specially complex recourse may be had to a photographic method. It is possible, with the aid of suitable experimental arrangements, to photograph actual sound waves in their progress through a model of the room under test, but the photography of water waves is simpler and gives as much information.

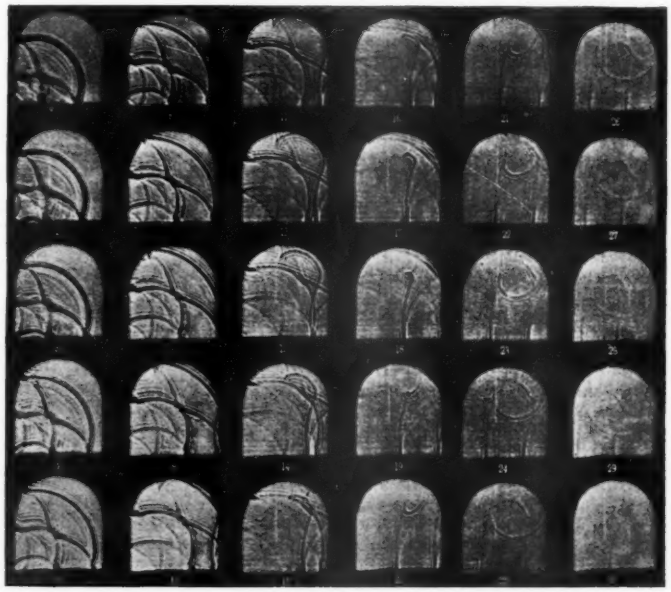

FIG. 19.—Progress of water waves in a vessel of the same shape as the Pantheon in Rome. Photographs at one-tenth second intervals.

Sabine has applied the photography of actual sound waves in advance of construction with marked success in several cases. Most notable of these is the Scollay Square Theatre in Boston. Had the original intention of the architect been carried out, there would have been a clear echo, as is shown by the distance and distinctness of the following wave in the two left-hand photographs of Fig. 20. On Sabine's advice the cylindrical ceiling surfaces were replaced by flat ones, and the disappearance of the echo is shown by the diffuse character of the following waves in the two right-hand photographs.

Wide experience goes to prove that curved walls are almost always a menace to good acoustics. That this is bound to be the case might be inferred from the fact that all whispering galleries—the famous one of St. Paul's in London, those of the Salle de Cariatides in Paris and the church of St. John Lateran in Rome, and that of the Mormon Tabernacle in Salt Lake City, and many others that might be named—are all dependent for their peculiar qualities on the presence of curved surfaces. Concentrations of sound in one or more places imply similar deficiencies elsewhere, and non-uniformity of distribution is the result.

Not only are main foci produced by curved surfaces, but, owing to the phenomenon of interference, there are also subsidiary foci. To what an extent this is so may be deduced from Fig. 21, which represents the distribution of intensity at head level of the sound emitted by an organ pipe placed at the middle of the floor of a room with a segmental ceiling, whose centre of curvature is at floor level.

It must be realised that there is a similar but not identical system for every pitch of note, including the simultaneous components of a complex sound, so that there tends to be distortion as well as non-uniformity of

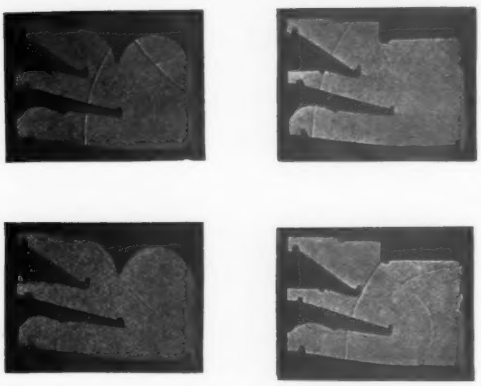

FIG. 20.—Showing the different characters of waves reflected from curved and flat surfaces.

loudness. A similar state of affairs was shown by Professor Raman and the writer to exist in the Whispering Gallery at St. Paul's Cathedral, where, if a pipe be sounded at one point of the circumference, points of concentration and silence are found round the circumference and also on proceeding inwards along a radius. At some points the octave of the note sounded is heard predominating.

One of the worst cases of the bad acoustics produced by curved surfaces is furnished by an auditorium in the University of Illinois. Here the form is roughly hemispherical, and from motives of economy the original intention of breaking up the walls was not carried out. The result was a chaos of sound. A speaker on the platform heard ten echoes of his own voice, and on one occasion the orchestra conductor heard the echo of an instrumental solo which was being rendered with orchestral accompaniment more strongly than the direct sound, and beat time with it, with what confusion can be imagined.

Figures 22 and 23 show the main concentrations of sound in this auditorium. These were inferred first from diagrams and afterwards from the path followed by an intense parallel beam of light directed at the various surfaces in turn. (It is to be noted, however, that the sound is not confined strictly within the limits of the light beams.) The offending surfaces were thus located, and temporary improvement was effected by hanging heavy sheets of canvas to prevent the sound from reaching these surfaces. The result was very unsightly, and the drastic action was then taken of lining the offending surfaces with felt. A difficulty arose when it was found that to felt all the offending surfaces would mean the introduction of so much absorbent material that the reverberation period when the hall was full would be too short, at least for music. The felt was therefore set in strips with equal interspaces, so as to cover only half the surface. It was also mounted on wood battens set at a little distance from the walls. This method of mounting gives slightly greater absorbing power, but the extra expense and the added danger of fire more than overbalance the advantage thus gained. The resulting condition of the hall was that the reverberation with 1,200 persons present was reduced from 2·7 to 1·9 seconds, which is very near 1·8, the compromise value that is found satisfactory for halls as large as this when used for both music and speaking. All the worst echoes were found to be eliminated, but there were still slight echoes from the unpadded surfaces.

While in general a curved wall is a menace to good acoustics, one form of surface, the paraboloid, has been used with success. If the speaker's head is situated at the focus of this surface the reflected wave is a plane wave, giving a parallel beam of sound, which thus reaches the farthest points of the room with undiminished intensity. This in effect carries the splaying of the walls and ceiling to perfection. It is the principle of design of the Hill Memorial Hall in the University of Michigan. Fig. 24 shows the basis of longitudinal section and plan, which were slightly modified in practice to accommodate an organ. Fig. 25 is a fuller section. The design was successful in that every member of an audience of 5,000 can hear perfectly except the occupants of three rows of seats at the back of the ground floor, which were added after the building as originally planned was complete.

It is necessary, of course, for the speaker in this case to occupy a particular position, though some slight freedom of movement is permissible. A disadvantage of the form of design is that sounds of rustling or whispering in every part of the hall will be returned to the focus, and the result may be unpleasant for the speaker.

The Hill Memorial Hall has a volume of 800,000 cubic feet. The reverberation period when the hall is full is 1·7 seconds, which is found to be too short for music. When the hall is only partly full the tendency is for the reverberation to be too long for speech. This is a difficulty that may frequently have to be provided against. More nearly equal periods for different degrees of fullness can be attained by upholstering the backs and seats of the chairs with suitable cushions.

It seems desirable at the close of this article to give special consideration to a particular class of auditorium, the council chamber. The three qualities of loudness, distinctness and freedom from distortion, important as they always are, are even more necessary, and at the same time more difficult of attainment, in a council chamber. Here a member may speak from any part of the room, and as a consequence his audience may be largely behind him. It is a matter of common experience that a sound falls off in intensity much more rapidly behind a speaker than in front of him, and

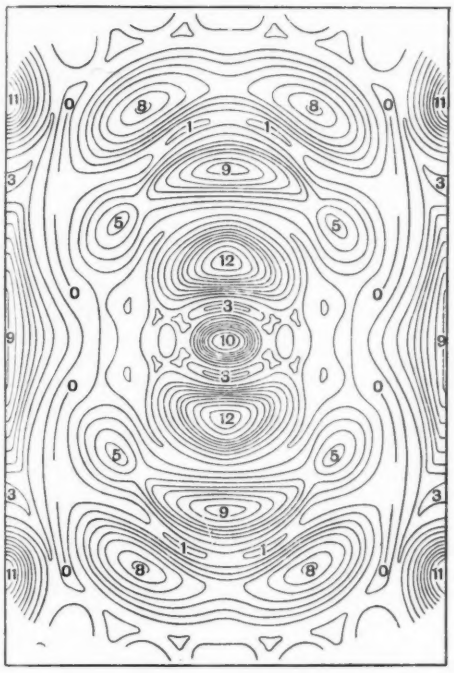

FIG. 21.—Showing the uneven distribution of intensity at head level produced by a curved ceiling. The lines are of the nature of contour lines. The source is in the centre.

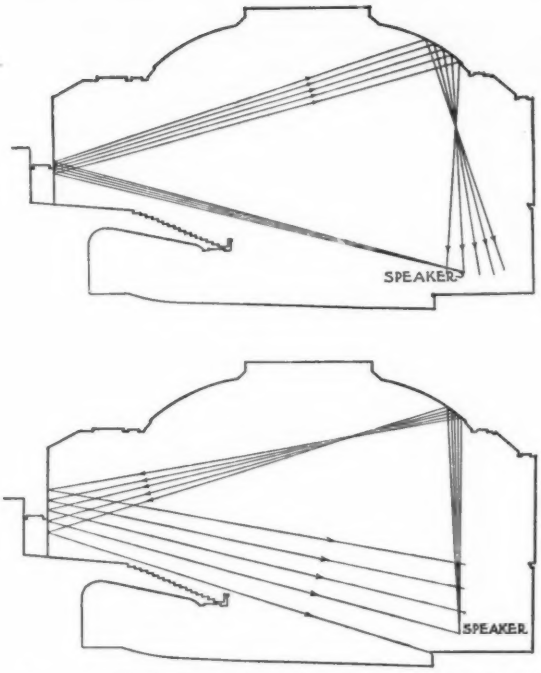

FIG. 23.—Illustrating echoes in an auditorium in the University of Illinois.

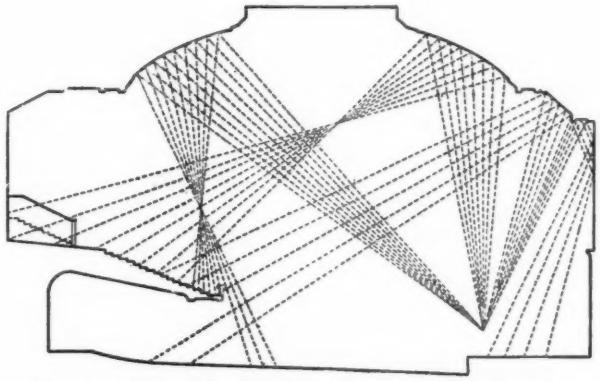

FIG. 22.—The main concentrations of sound in an auditorium in the University of Illinois (Longitudinal Section).

therefore the provision of hard reflecting surfaces which will reflect the sound as quickly as possible to every member of the audience, including visitors and representatives of the Press, is essential. If the ceiling be kept low, it will act as a suitable reflector for this purpose. In addressing an audience partly in front of and partly behind him a speaker very often turns his head from side to side, with the result that points are missed. The advantage of making the ceiling the main reflecting surface will be clear. If a wall surface be chosen it will be necessary to train councillors to face in a particular direction when speaking.

Particular care must also be exercised to secure adequate distinctness. In a council chamber a member expects to be able to address his audience intimately, and not to have to enunciate his words as slowly or clearly as he would in the formal address of a large audience. This, and the fact that in a council chamber, with councillors entering and leaving and possibly conversing in undertones, there is always a measure of extraneous noise, make it imperative to have a specially short period of reverberation.

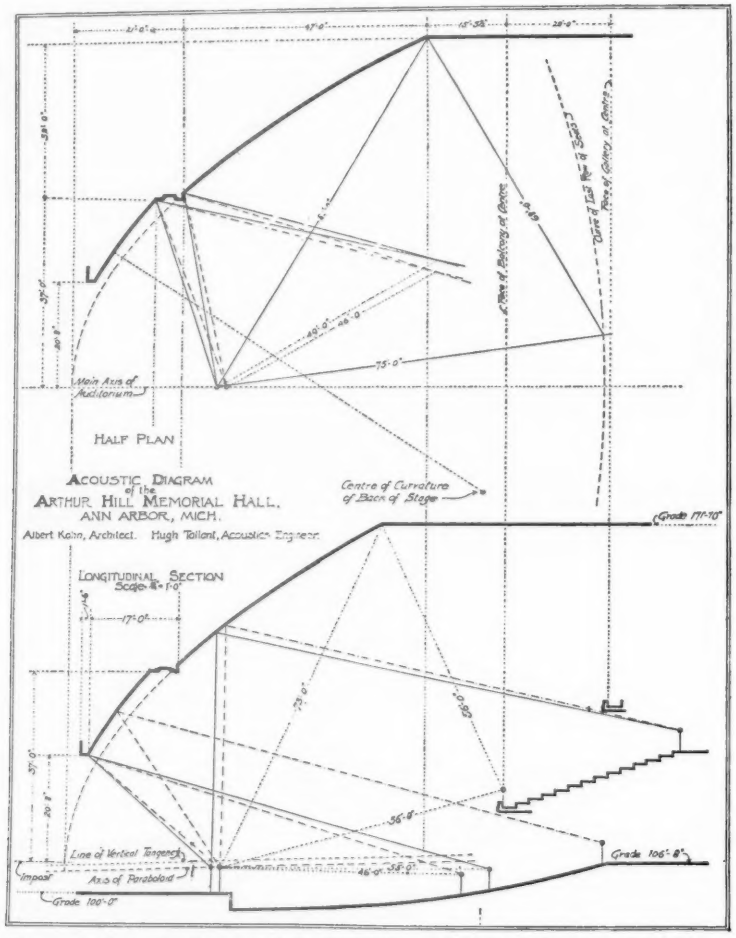

FIG. 24.—Acoustic diagram of the Hill Memorial Hall, University of Michigan.

The London County Council Chamber fails in all these respects. The direct line condition is not satisfied; for the Press is relegated to a gallery in a deep recess out of sight of the chairman. The ceiling is so

high that it cannot be used as a reflecting surface. If it were a good reflector, then sound returning from it would constitute an echo. If it could be made perfectly absorbent, then all the sound proceeding above the horizontal from a speaker would be lost to the floor of the house. As it is, the ceiling is partially absorbent, and so, instead of a discrete echo, there is confusion. The high ceiling and the recessed galleries make the volume large, and the result is excessive reverberation. Absorbent material has been introduced to reduce this, and it is now being stated that, although the reverberation is still slightly excessive, yet there is more absorbent material than the Sabine theory requires. This shows a complete misunderstanding of the whole question, for the Sabine theory requires the introduction of absorbent material until the reverberation is no longer excessive. Unfortunately, recourse is being had to quack methods of cure. A canvas velarium was introduced, too small and too high up to give the necessary false ceiling effect. This has now been replaced by a muslin one, which will have as much effect on the sound waves as a fishing-line would on the breakers on a seashore.

Nothing can now make the acoustics good in the sense that they would have been good if the room had been designed in the first instance as a council chamber and not as a monument ; but some improvement might be effected by introducing further absorbent material into the upper part of the hall and by providing a suitably inclined surface, which the speaking member might face, to reflect the sound on to the floor of the house. This would not, of course, affect the galleries. Alternatively, consideration should be given to the possibility of inserting a false ceiling, which could be of glass, to reduce the volume and provide a reflecting surface at a suitable height. It is true that certain legislative assembly rooms on the Continent of Europe are monumental in type and yet fairly successful acoustically ; but there the problem is a different one, for there it is the custom for the speaking member to address the assembly from a rostrum position. That this is a very material consideration is evidenced by the fact that in the London County Hall every member on the floor can hear the chairman.

Within the past year prizes have been awarded in competitions for designs of legislative assemblies in Cairo, Colombo and Calcutta. All these are of the monumental type, and are bound to be acoustic horrors. It is time that something was done in this matter, and architects who act as assessors in competitions would do a signal public service if they refused to consider as eligible any design that did not conform at least to the reverberation period appropriate to the particular class of auditorium, if not to a more detailed acoustic specification.

It is not uncommon in designing a house to take account of the fact that a beautiful house means not simply a beautiful structure but a beautiful place to live in. It seems no more unreasonable to demand that an auditorium shall be not simply a beautiful monument, but a beautiful place to speak and hear in. Acoustic quality is never the sole consideration in design, but it is a consideration of prime importance. To ensure it consistently with the demands of engineering and art is no unworthy task for the architect to undertake.

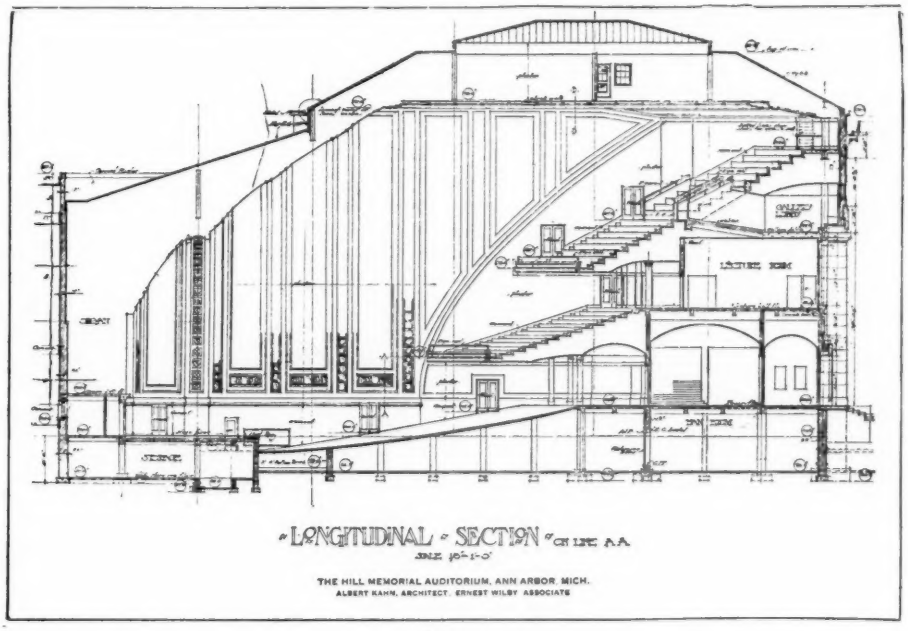
LONGITUDINAL SECTION ON LINE AA
SCALE 1/8"-1'-0"
THE HILL MEMORIAL AUDITORIUM, ANN ARBOR, MICH.
ALBERT KAHN, ARCHITECT. ERNEST WILBY ASSOCIATE

FIG. 25

The Planning of the Modern City *

BY H. V. LANCHESTER [*F.*].

THE author of this book opens with a few words of apology for producing another work on the subject, but we may affirm at once that the work amply justifies its inception, being a contribution of undoubted value.

In order to indicate its scope it may be well to quote the attitude towards this question as stated on the first page :—

It is the hope of the author that municipal engineers will find the following pages of some value in bringing to them a somewhat keener realisation of their part in, and responsibility for, the constructive work of city planning as well as city building. Most of the literature of this subject has been contributed either by architects, who emphasise its architectural or artistic side and appear to consider it an architectural problem, or by students of city government, who seem to regard it as an administrative problem. This volume is just as frankly written with the idea that the fundamental problems of city planning are, and from their very nature must be, engineering problems.

Now it need not be inferred from this that the engineering aspects take up an undue proportion of the book, which balances on the whole fairly accurately the various interests of Town Planning. Transportation and Streets, Parks and Recreation, Economics and Industries, Zoning Restrictions, Housing, Legislation and Finance all receive attention, and this of a broadly comparative and comprehensive kind that gives their presentment value and interest.

Naturally, there is less grasp when the æsthetic considerations arise, but the author has already discounted criticism on this score, in expressly stating that the subject is regarded more specifically from the standpoint of those usually charged with putting a scheme in operation.

The first four chapters review the more recent history of City Planning ideas and activities, including in a summarised form the question of improvement as well as development.

Chapter V., on Transportation, is one of the most valuable sections. Opening with a somewhat too condensed sketch of docks and water facilities, it passes on to rail transit in city areas, and gives the following useful table of comparative costs (for one mile of single track) :—

	$
Tramway overhead trolley, on sleepers ..	25,000
Tramway, overhead trolley, on paved street	41,500
Tramway, underground conduit, on paved street	48,500 to 126,500
Elevated Railroad on steel viaduct ..	113,000
Elevated Railroad on masonry viaduct ..	330,000
Underground Electric (New York) ..	1,190,000
C.I. Tube tunnel below water level ..	2,700,000

These are all from American examples, but may be of value for the purpose of comparison. Much of the traffic dealt with is of an intensive character, and the hints as to how this can be handled are very much to the point.

One thing that strikes the reader is the tendency to identify the alignments for streets and rail transit, and to form elevated or underground lines where it would be obviously more economical in construction to plan suburban routes independently of, rather than along the lines of, the main roads. The costly Queen's Boulevard route, New York, is an example of this.

Chapter VI., on the Street System, is of less importance to English readers, as, if it accurately represents American practice, this is somewhat primitive and unscientific, particularly in respect to site subdivision. The following chapter, on Parks and Recreation, illustrated from American examples, contains some useful statistics, and the next, on Public Buildings and Civic Centres, is mainly notable for its series of illustrations of the Grand Central Station, New York, which takes first place among the great terminal stations all the world over for skilful arrangement and practical efficiency. The other illustrations are well chosen from typical American examples. After a chapter pointing out economic advantages of framing a city plan and another on a few types of the industrial town, we come to Chapter XI., on Street Traffic, in which will be found a good many interesting suggestions as to the ways in which this should be provided for and dealt with. Tables and statistics compare the number of fatal street accidents in various cities, and indicate in most of these a rapid increase during recent years.

Chapter XII., on Street Details, has some useful notes on street lighting, and closes with some illustrations of the exterior illumination of public buildings at night. Chapter XIII. deals with a problem that looms largely in America—namely, the substitution of

* *The Planning of a Modern City : a Review of the Principles Governing City Planning.* By Nelson P. Lewis, with the assistance of H. M. Lewis. [New York : J. Wiley and Sons.]

over or under railway bridges for level crossings. It is of interest to note that the contribution claimed from the railways towards the cost of such works ranges from 50 per cent. to 75 per cent., and that, subject to certain limitations, the necessary regrading and reconstruction, including substantial modification of the railway level, is compulsory. Thus the local authority is in a very much stronger position than in England.

The following chapter combines the questions of building restrictions and zoning, which might well have been dealt with separately—though there is something to be said for the view that all types of restriction might be treated on a zoning basis.

The following extract from the report of the New York Committee illustrates the general position taken up in respect to zoning :—

Anything that will tend to preserve the character of a particular section for a reasonable period of years will tend to bring about the uniform improvement of the section. A large proportion of the land of New York City that is now unimproved or poorly improved is in that condition because the owners feel that the character of the section is changing, is bound to change in the near future or that the permanent character of the section is unknown. If restrictions were imposed so that the general character of particular sections could be forecasted with reasonable certainty for a period of years, owners who had been holding back on account of the uncertainties of the situation would find it clearly to their advantage to improve their holdings. The result would be that these restricted sections would be more quickly built up with buildings of similar type and use. This should have the effect of improving living conditions, reducing the cost of living, and maintaining real estate values.

Any growing city that fails to control building development must inevitably suffer enormous loss due to building obsolescence. Obsolescence may be defined as lack of adaptation to function. It results from changed conditions and surroundings that render the building inappropriate for the particular location. The total social loss does not consist merely of the great cost of building reconstruction or of the great decline in the rental value of the inappropriate buildings that are not reconstructed, but there is added to this the social loss due to the retardation of real estate improvements owing directly to the obsolescence hazard.

The need for the creation of special restrictions for special districts is most clearly exemplified in the case of suburban residence districts. Here real estate developers have often found it profitable to secure control of large areas in order by restrictive covenants to insure to intending purchasers of homes the creation and maintenance of a residence section of a certain desired type.

And this subsequent one indicates the effect of the New York zoning ordinances :—

It has checked the infiltration of hurtful industries in business and residence localities ; it has entirely excluded public garages and service stations from residence districts and, except in special cases, from business districts ; new stores cannot be placed at will in residence districts, but must be confined to business streets where rental values are consequently improved ; old-established residence districts will continue as such, and home owning citizens can stay there ; while not specifically forbidding apartment houses, the area restrictions have prevented their invasion of districts where only a small proportion of the lot areas may be built upon ; a new type of business and office building has been evolved which allows light and air to reach the streets ; additional open spaces on building lots has made the structures more habitable and sanitary ; there is a tendency to distribute population instead of concentrating it, rendering the transit problem less difficult of solution ; owners of attached houses are maintaining them in better condition as the menace of invasion by business or apartment houses has passed and property values generally have been stabilised.

Altogether the case for zoning is logically and clearly put.

Chapter XV. deals with the Environs of the City, and that which follows with Garden Cities and Suburbs. The short Chapter XVII. on Legislation is of course a very brief summary of a subject that demands a volume to itself. Then we come to some interesting notes on propagandist methods, and those which have been so successful in America in securing financial aid for the preparation of a comprehensive city plan.

Chapter XX. discusses the principles which should govern land acquisition by municipalities, and puts the various points of view fairly and reasonably. The decision arrived at is that the community should, by land purchase or other means, be assured of a share in the values created by their presence and their labour.

The closing chapter is addressed to the municipal engineer, and points out the rapidly increasing responsibility that rests on him in guiding city development, and how he should make every effort to qualify himself to meet it. The opinion, previously expressed, that town planning is primarily a matter of engineering, is reiterated, and if we feel that the other aspects are unduly minimised, we must admit that the engineer's functions, as defined, are extended to cover as much of the ground as possible.

Reviews

DUBLIN OF THE FUTURE. *The New Town Plan, being the Scheme awarded the First Prize in the International Competition. By Patrick Abercrombie, M.A., A.R.I.B.A., Sydney Kelly, F.S.I., and Arthur Kelly. Volume I of the Publications of the Civics Institute of Ireland. [The University Press of Liverpool and Hodder and Stoughton, Ltd.] London.* 1922. £1 1s.

The International Competition promoted in 1914 by the Civics Institute of Ireland to elicit designs and re-

ports of a tentative nature on a plan for " Greater Dublin " was, in the language of the scribes, a brave " gesture." So, too, is the publication of this book at the present moment. The members of the Civics Institute of Ireland, under whose auspices the volume is published, feel that with the recent change in national circumstance a new epoch has begun, and that the present is a most opportune time to arouse the interest of the citizens. And so Dublin—with all its comparative disadvantages—has done what, after all, but few cities have succeeded in achieving.

The book is dedicated to the Most Hon. the Marquis of Aberdeen and Temair, K.T., G.C.V.O., G.C.M.G., LL.D., etc., and the Marchioness of Aberdeen and Temair, LL.D., etc., to whose munificence, and personal interest in the welfare of the City of Dublin, this scheme of Town Planning for its future is entirely due.

The Marquis presented a prize of £500 for the best design submitted in this competition, and one gathers that it was the offer of this prize which made the competition possible.

On the various ways of spending £500 we might well meditate. The Marquis of Aberdeen and Temair selected an original method—it is, indeed, probable that he is the first to spend this sum in precisely this way—and he has clearly set a most excellent precedent.

Dublin of the Future shows what good results followed that munificent gift. Eight sets of plans and reports were submitted, and on these Professor Patrick Geddes, Charles F. MacCarthy (City Architect, Dublin) and John Nolan were asked to adjudicate. So impressed were the adjudicators with the excellence of the work submitted that they could only make their final award after prolonged and repeated scrutiny, though they were then unanimously of opinion that the scheme submitted by Professor Abercrombie, Sydney Kelly and Arthur Kelly was the best as regards all three heads of the competition—Communications, Housing, and Metropolitan Improvements. Four Honourable Mentions were also awarded unanimously by the adjudicators, who expressed a desire for the publication of all the reports, especially for that submitted by Messrs. Ashbee and Chettle. Of this latter report the adjudicators write as follows : " Its sympathetic appreciations of historic growth and architectural traditions, its understanding of present deterioration, and this both in its causes and its consequences to the condition of the people, its appeal for Civic Survey, and its lucid indications towards this, and the fine spirit of hope and ardour with which its many and able constructive proposals are put forward, make this volume well worth completion and separate publication, and one which should be read not only in Dublin but by city improvers everywhere."

This high praise of an unsuccessful report makes it clear that, as one would expect to be the case, the work of Messrs. Abercrombie, Sydney Kelly and Arthur Kelly reaches a remarkably high level, and a study of *Dublin of the Future* fully confirms that view.

The authors fully realise that a competitive scheme is prone to produce in such a report faults which a maturer consideration would wish to remove. It was impossible, however, to bring their plan up to date without unfairness to other competitors, and they therefore decided to publish the competitive scheme supplemented with further drawings, reinforced with additional data, and revised only so far as is consistent with the original framework. It is also made fully clear that the recommendations in the report are tentative, and that no work should be commenced without a thorough systematic investigation by means of a civic and regional survey to provide the necessary information which was not available to the competitors." The report deals in considerable detail with problems connected with the Harbour, the Liffey and other waterways, railways, road systems, tramways and a suggested power citadel at the mouth of the Harbour. The local industries and their location are also considered, and a new site suggested for future abattoirs.

Under the heading of Housing the report, after considering the existing conditions, gives an outline of general policy and deals in some detail with intra-urban and extra-urban areas (giving types of cottages, lay-outs, etc., in both cases), neighbourhood centres and allotments.

The third part of the report, dealing with central improvements, public buildings, architectural character of suburban growth and the park system, opens with a zoning plan indicating the relative position of factory areas, rehousing areas, open spaces, etc. The suggested central improvements which follow are particularly interesting, well illustrated and ably described. Especially useful is the period plan, showing how certain valuable improvements could gradually be realised. The report wisely states that any suggestions for the grouping of public buildings in Dublin must be dominated by historic considerations, the occasion not being one for the planning of a huge monumental civic centre, the new centre of the town being at most a traffic heart.

Dublin of the Future is a valuable addition to the literature of Town Planning. It is beautifully produced, the paper and printing are excellent, the illustrations numerous, clear and definite. Special reference should be made to the fine imaginative frontispiece, " The Last Hour of the Night," by Harry Clarke.

W. S. PURCHON, M.A. [*A.*].

A NEW FRENCH SYSTEM OF ARCHITECTURAL EDUCATION. *Cours d'Architecture et de Constructions Civiles. Par M. E. Arnaud.* [*5 vols. Paris.*] 1923.

Presented to the Institute's Library by the author, Professor to the Ecole Centrale des Arts et Manufactures and also at the Ecole Nationale Supérieure des Beaux-Arts, this series of five volumes, together with an additional volume of plates, presents a very thorough and careful *exposé* of the lectures he gave to the second-year students of l'Ecole Centrale, in Paris. A separate Table of Contents, clearly tabulated, is subjoined.

In the first part, the author studies all the stages, twelve in all, which both the architect and the builder have to go through, from the time when the programme of any particular building is given to the architect to the last stage, when the building is entirely finished and all accounts settled. The most important of all, " Composition " or " Design," is studied at length. But in order to go from the fourth stage (settling the sketch design) to the later ones (working drawings, specification, estimate, and so on), the architect requires technical and practical knowledge, getting every day more extensive, which makes up the second part of this important work.

In the second part, therefore—the most thorough, requiring three volumes, with 502 illustrations in the text and 287 plates—the sequence followed is, so far as the greater part is concerned, unusual. After beginning with a chapter on reinforced concrete, considered as a material and as a mode of construction, the author, instead of devoting special chapters to each " corps d'état," a method which apparently fails to show the sequence binding them together, follows the order in which the building is erected, viz., from the foundations up to the roofing. He sets down and comments upon all the known methods of construction, all the questions of hygiene and all the specific difficulties which, in practice, crop up in the course of building operations, and which it is necessary for the builder as well as for the architect to consider. He brings out all the fundamental principles governing each problem, and gives by means of numerous sketches and drawings the methods used in practice, and often adds photographs of executed work.

The first two volumes treat especially of the main building, the structure itself, including roofing and staircase ; the last volume deals with all metalwork, partitioning, parquets, cement flooring, asphalte, mosaic, marble, linoleum, fireplaces, flues, all water installations, lavatory, gas installations in the house, central heating, lifts, and internal decoration.

In the third part, the author summarises what has been set forth and applies what has been propounded by the study of an important and actual series of operations carried out in the " Rue des Italiens " and of the houses bordering it on either side. This part contains 77 plates, sketches and drawings in the text, and 47 large plates.

What strikes one most, after a careful perusal of this work, is the accuracy and thoroughness shown in tackling the problems under review ; also the essentially French character of the modes of construction. The detailing is equally very French. The text is lucid, but the plates, on the other hand, although clear enough, suffer from a somewhat casual method of presentation which compares unfavourably with the standard obtaining in England or in the U.S.A. But they embody valuable information, such as the huge and handsome hangar for two dirigibles at Luçon, the size of which would easily encompass the Arc de Triomphe de l'Etoile, in Paris, or the steel frames to industrial buildings. But it is, nevertheless, a very serious piece of work, and one which will, no doubt, commend itself to our own students, architects, and builders. It is published by l'Imprimerie des Arts et Manufactures, 8 Rue du Sentier, Paris.

GORDON HOLT.

PRACTICAL STRUCTURAL DESIGN. *By Ernest McCullough, C.E., Ph.D.* [*U.P.C. Book Co. Inc., 243–249 West 39th Street, New York.*] 1921.

This work is confined to the theoretical side of structural design. That it is not intended for English students is shown by the many references to trade books issued by American firms which British students would not have the opportunity of pursuing, whilst other chapters, again, are devoted to details of timber construction (essentially an American practice). On the other hand, beyond elementary principles no useful data are given about reinforced concrete structural design. This seems rather a serious omission at a time when buildings in reinforced concrete are tending to rival in number and importance those designed to be framed wholly in steel and (or) timber.

The general information given throughout is lucidly stated, but the book loses in value by too few illustrations and diagrams, those which are given being so small that the detail is lost, or the figures are not readily legible.

The scope of the book also seems to demand fully worked out examples of such essential parts of a structure as plate and rolled steel girders and stanchions with their connections ; lattice girders and framed steel roofs, etc. Such examples would render the book much more interesting and informative for draughtsmen.

The arrangement, or lack of arrangement, adopted by the author is a distinct falling off from the accepted method in this country of maintaining a clear division, generally by means of separate volumes, between structural and theoretical problems. In the circumstances, therefore, the book can scarcely be seriously considered to fulfil the author's claim that it is " written especially for self-tutored men."

Generally speaking, it cannot be said that the book contains information not readily available to English students, nor is such information more lucidly described or illustrated than in the many excellent text books published in this country.

P. M. FRASER [*F.*].

Exhibition of Drawings by Students Exempted from the Final Examination

BY ARTHUR J. DAVIS [*F.*].

The greatest interest attached to a visit to the University of London Bartlett School of Architecture, at University College, Gower Street, where the designs of the students exempted from the final examination of the R.I.B.A. have recently been on view. The exhibits are remarkably good as a whole, especially when one remembers that the very best work of the schools is not presented, owing to the designs submitted for the important prizes being ruled out of the Exhibition. The drawings indicate clearly the methods of our principal schools of architecture in directing, each in its own way, the education of their advanced students. The results show much architectural skill applied to a comprehensive and varied group of problems, from the point of view of composition, combined with practical knowledge and sound construction. There are exhibits from the students of the Architectural Association, Liverpool University School of Architecture, Glasgow School of Architecture and the Robert Gordon Technical College, Aberdeen. Unfortunately, owing to a readjustment of their course of studies, the London University School is not represented. The R.I.B.A. Board of Architectural Education Silver Medal for recognised schools will be awarded for the best set of designs submitted at the Exhibition.

A glance at the designs is sufficient to enable one to see the different influences in each school. The Architectural Association, the Liverpool University, and the Glasgow Schools of Architecture are evidently fortunate in being under the guidance of leaders of experience and ability. The results they have obtained are sufficient to demonstrate the advantages of a sound theoretical training over the more haphazard methods of apprenticeship as practised in a former generation. The profession should realise that we have to-day in Great Britain schools with a standard of education capable of challenging that of other countries where the importance of the study of theoretical architecture has been recognised for a far longer period. A criticism, which for many years was levelled at our schools by those who had not closely followed the development of their curriculum, was that the study of construction and architectural practice was sacrificed to the production of attractive but unworkable designs. This objection no longer holds good ; on the contrary, at the Liverpool University, in some cases, the pendulum seems to have swung too far in the opposite direction, and the drawings of at least two of their students are more interesting from the point of view of construction than as examples of architectural compositions. The Liverpool University is certainly to be congratulated upon its efforts to deal with the practical and constructional side of architecture, but this should not be at the expense of other qualities which are even more important. It cannot be too often repeated that architecture is an art first of all, and whereas in everyday, practical building assistance and advice on construction can be obtained from experts, yet there is no hope for an architect who is incapable of handling his own problem as an artist from its very inception. The designs exhibited are so varied and so numerous that it is impossible to examine them closely in the space at my disposal. The work of the students of the Architectural Association Schools and that of the University of Liverpool are both of high merit, followed at some distance by that of the Glasgow School. Considerably below these comes the work of the students of the Robert Gordon Technical School, Aberdeen.

I do not propose to review all the exhibits, but shall confine myself to a discussion of the salient points of those of particular interest. Starting with the work of the Architectural Association, the designs submitted by Miss Chambers immediately claim attention. They prove her to be a student of considerable knowledge and versatility, and are, all four, of a high standard. Her Town Planning scheme is clever and interesting, but she should have made more of the sea-front, although the contours which were given in the programme may have hampered her in this respect. Her layout for an Exhibition in Hyde Park is a very fine conception, and shows great skill in handling detached groups of buildings. The arrangement of the various sections of the Exhibition is excellent, and from the main approach over the bridge the entire plan is at once visible. She has kept her large court open to the afternoon sun, and has considered the general composition in relation to the Round Pond and Kensington Palace. The principal vista has been cleverly conceived, but one misses a culminating architectural feature at the end of the perspective. The hall unfortunately blocks the entrance of the courtyard, and would, in my opinion, have been much happier if it had been placed at the extreme east end of the plan, where it would have also provided a motif from the Park Lane side. The individual buildings in the composition have been laid out and connected with skill, and the visitor to any particular section should be able to find his way about easily and without fatigue. Her town house shows that she has grasped the chief requirements of this interesting problem. The two fronts, where good light is obtainable, are used to the best advantage, and on all floors the services and staircases are in their correct positions. The passenger lift, by its unfortunate situation, has created difficulties all the way up, as it masks what might have been a successful source of light to the corridors. Miss Chambers will forgive me if I observe that her larder opens directly out of the kitchen, that she appears to have forgotten the fuel store required in the programme, and that her scullery opens on to the main corridor. In the dining-room the position of the service door would give the guests seated at the table opposite a direct view of the entire service room. On the upper floors the relative arrangement of doors, fire-places and windows is faulty, as in these rooms the beds could not be placed in the best positions. The interior decorations evidently aim at simplicity and restraint, but they are cold, and show a lack of imaginative quality. The treatment in colour of a Café Restaurant on an island is remarkably good so far as the elevation is concerned. The voids and solids are well proportioned, the colour scheme is gay, and the whole design shows a characteristically light and cheerful handling. In plan, the great curve of the external wall of the

restaurant would look unpleasant both from the inside and exterior.

Mr. C. Jellicoe has designed his Hyde Park Exhibition with the main entrance and principal vista from the east, a mistake in my opinion, as the group from the Serpentine would be unpleasing, and on leaving the Exhibition the eye would be conveyed to an irregular arrangement of houses in Park Lane. Again, he has committed the fault, so often noticeable in students' plans, where a "symmetrical parti" has been adopted, of endeavouring to balance groups of unequal importance on either side of a main axis. His scheme for Public Baths shows considerable merit, but he should not have duplicated his circulations, and the porticoed screens leading to inadequate rotundas are thin and poorly designed, and by no stretch of the imagination could they be considered suitable for the purposes mentioned in the programme. Mr. Jellicoe has missed the character of the elevation, which is dull and uninspired. The long row of grotto-like arches facing the swimming bath are heavy and uninviting. He deserves praise, however, for the way in which he has studied and presented his half-inch detail of the bathing pavilion, and this drawing alone is sufficient to demonstrate the progress in practical knowledge made by the latest students of the Architectural Association. Mr. C. Hyslop presents an interesting layout for a seaside pleasure resort, and his design for a monumental fountain is well proportioned and in good taste. His suburban house and swimming bath are both below the standard of his other work. Mr. C. Crickmay's work is also worthy of notice. His Kensington scheme is faulty as regards the approaches, and the central court is too congested. He has treated the plan of his bathing establishment with skill, and the changes of axis are cleverly arranged.

Before leaving the discussion of the work of the students of our principal London School of Architecture it is refreshing to note the trend towards the elimination of unnecessary classical orders and columns, which have so long been considered an essential factor in all beginners' designs. Apparently they are now encouraged to attack their problems in a modern spirit, only using traditional forms when these are necessary.

On the first floor are the exhibits from the Liverpool University, an ensemble which makes a very fine show, and I regret that the exigencies of space prevent me from describing the drawings as they deserve. Mr. C. Hutton has sent a fine set of drawings for a Repertory Theatre, one of the best designs in the Exhibition, but its merits are seriously challenged by the unfortunate drawings of other buildings which accompany it. Mr. Hutton should seriously consider his position as an architect. He is evidently carried away by his interest in working out the details of steel construction in preference to the study of architectural forms. I frankly admit my incompetence to criticise the details of his cantilever girders, trusses and grillages, and was much relieved when a friend of mine, a member of the Institution of Civil Engineers, volunteered to give me his opinion of these drawings. He informed me that the detail showed engineering ability, but that he considered it fell below the standard of good modern design. The plans and elevations of the theatre are difficult to criticise, as they are represented by blue prints, but the general scheme appears to be sound and the programme well studied. Winders on important staircases cannot be recommended in any theatre, and the design of the proscenium arch does not fit in happily with the remainder of the decoration. The plans and elevations of the Kursaal by the same author are disappointing. The desire for symmetry at all costs has prompted him to balance the large swimming bath on one side of the courtyard with a multitude of small compartments of the Turkish bath on the other. The important features of the plan are not translated in the elevation, which in itself is poorly proportioned. Out of this programme he might have produced grouping of character and interest if the different parts of the scheme had been expressed in their proper relation. His Palais de Danse plans and City Viaduct are equally disappointing, especially when compared with the merit displayed in the theatre design.

Mr. E. Fry has sent in some good work, but the different departments of his seaside restaurant are not planned logically in their proper proportions. The entrances are too narrow for such an enormous restaurant; the kitchen, which leads straight from this room, would be impossible as planned, and the tea-room has insufficient direct outlook. His commercial building contains too many public vestibules with a consequent lack of area for letting purposes. In elevation the double attic over the high frieze produces three superimposed horizontal divisions of equal weight, thus destroying the value of the upper part of his façade.

Mr. E. Higham, like Mr. Hutton, is evidently more at home with constructional detail than with architectural design. His building for the storage of documents and his theatre both show that he has yet something to learn as regards proportion and taste in architecture.

Mr. H. Hirst's College Chapel is well studied and interesting, but his Kursaal plan shows the fault abovementioned of endeavouring to balance unequal masses symmetrically.

Mr. Brook exhibits a very ambitious plan of a University Assembly Hall, into which he has crammed as many columns as possible regardless of their functions. His elevation is cold and characterless, and the two pavilions on either side of the main portico do not balance. His cinema theatre interior is better, but he should be careful not to make use of the orders in and out of the season.

I noticed a good plan of an Office Building by Mr. Knight. The entrance hall, staircase and lifts are in their correct positions, and the light well is sufficient for its purpose. Mr. Knight's elevation is restrained in character, but the upper portion of the building is badly composed, and, owing to the heavy cornice below, the loggia would not produce the desired effect from the street.

From the Glasgow School, Mr. G. Fergusson sends a scheme for a Parliament House for a Federal State. His design is compact, and its mass well balanced, but the draughtsmanship is slovenly, and his sections, if considered as working drawings, quite inadequate for this purpose. His design of a Collector's House is not well drawn and rendered.

Mr. J. A. Coia sends a Byzantine Church of no great interest, and the façade of a Royal Palace, which, while denoting a certain skill, is overcrowded with indifferent

ornament. His Municipal Buildings are well planned, and the elevations have a certain dignity, but the drawings are produced in a confused manner, and would undoubtedly puzzle any unfortunate contractor whose duty it might be to execute the work from the information they contain.

Mr. J. Scott Sutherland's drawings (Aberdeen) for a Municipal Building are somewhat immature, and badly presented. Among other faults, the central dome, which might have provided an interesting feature, would not be visible from either side of his building.

There are many other fine schemes which also deserve attention, notably a Mosque by Mr. M. Raafat, full of Eastern character, carefully worked out both from the artistic and the constructional sides, and I regret that space does not enable me to extend this list still further.

AUTUMN PICTURE EXHIBITIONS.

The most important exhibition of modern pictures which has recently been opened is the Exhibition of Australian Art at the Royal Academy, "organised with the object of showing the British public the work of the artist resident in Australia." The exhibition contains much sincere and good work, and is certainly creditable to the art feeling of a country in which the population is comparatively small and scattered over vast areas. As might be expected, the great majority of the pictures are devoted to landscape, but without suggesting anything especially idiosyncratic in Australian scenery; and there are also some good portraits. Australian artists as a body seem to have escaped the influence of "new movements" which have more or less affected European art. Mr. Lionel Lindsay's pictures, which have attracted so much attention, are skilful, but not otherwise remarkable.

At the Grosvenor Galleries a room is devoted to the work of Mr. Henry Rushbury, A.R.W.S., which will certainly contribute to his reputation. Mr. Rushbury has a love of old and new streets, old and new buildings, and discovers for us a new interest in scenes that are familiar to most students of architecture. His subjects are taken from Rome, Florence, San Gimignano, Paris, Rouen and Marseilles, and none of them is hackneyed. His views of the Badia and the Bargello at Florence, the Place de la Concorde at Paris, the Quay at Marseilles, the Towers of San Gimignano, are amongst his most successful evocations. The drawing of the Lothbury Court at the Bank of England has an especial interest in view of its prospective demolition.

The Cotswold Gallery retains in its third annual Exhibition the selective and exclusive character which has distinguished its predecessors. It is a little world apart from the typical exhibition, in which any picture of a noisy colour would be a shock. Mr. F. L. Griggs, A.R.A., is the chief exponent in water-colour, a medium in which he conveys the depth, sensitiveness and poetic beauty which are to be found in many of his etchings and drawings. In his texture Mr. Griggs seeks for greater solidity than is usual in water-colour drawings. Mr. Arthur M. Hind, Oxford's Slade Professor, Mr. William Rothenstein, Mr. Russell Alexander, and Miss Edith Payne are amongst the other exhibitors.

"THE LISTER WARD."

ROYAL INFIRMARY: GLASGOW.

By William A. Pite [*F.*].

Mr. James A. Morris, A.R.S.A., of Ayr, has published a short pamphlet entitled *A Humble Plea for the Retention of the Famous Lister Ward in the Royal Infirmary of Glasgow*. We sincerely hope it may be possible to preserve the ward, and so terminate the discussion which is causing widespread concern in Glasgow and throughout the country. *The Times* had an admirable article entitled "Vandalism at Glasgow," and other distinguished advocacy has come from Lord Rosebery, Lord Blythswood, Earl Haig, and the Lord Provost; while a growing public opinion is in favour of preserving the ward of one who has been so aptly described by the eminent French surgeon, Professor Just Lucas-Championnière, as the creator of modern surgery.

If it were merely a matter of architectural propriety the difficulty might be settled right away, but we are unaware of the local circumstances, and they do not affect the very general desire to save the building. The outstanding facts seem to be as follows:—

Upon the site now occupied by the new magnificent Royal Infirmary stood a former building characteristic of its day, which, having usefully served its purpose, had to be displaced by the urgent claims of advancing medical and surgical requirements. In the forecourt of the Royal Infirmary stands a fragment of one of the wings of the original building, and it is the lower ward of this block that we believe it is desired to retain as a memorial to Lord Lister, the man who, with M. Pasteur, has been a benefactor to the races of the world.

Mr. Morris effectively discusses and dismisses the objections which have been advanced, and offers a practical solution which is worthy of close consideration. The proposal is to retain the lower ward and insert a roof before the upper storeys are removed, and to utilise in the construction such features as external cornices, etc., which may be necessary to provide a complete building. In this way it will be possible to retain the famous ward, which could be fitted up in the condition that ruled in Lister's time, and so provide an example of a ward of the Victorian period which would illustrate "things as they were." The adjacent rooms would be utilised for museum purposes.

We have similar memorials in the Dr. Johnson House at Lichfield, and in the Carlyle House, Chelsea, etc. Foreign nations have honoured the achievements of Lord Lister by memorials to his genius, and it is surely a small thing that his countrymen are now asked to do in preserving, we say if possible, this ward to his honoured memory, and for the information of generations to come who yet will benefit by his labours.

Lord Lister's gentle retiring nature would no doubt have repudiated these suggestions; but it is a duty which posterity owes to itself gratefully to keep in memory the beneficent labours of one who spent his long life to save his fellows. Surely architectural amenity may in this case bow to what should be inevitable.

Legal

The following communication has been received from Mr. W. E. Watson [*F.*], barrister-at-law :

BUILDING OWNER'S LIABILITY FOR QUANTITY SURVEYOR'S CHARGES.

The statement in the JOURNAL of 14 July by the Solicitors to the Institute raised an interesting point, and it will be admitted that the instruction from a client to the architect to obtain tenders for works costing more than £2,000 normally implies authority to bind the building owner for the expense of preparing quantities. It is usual, however, for the architect to mention the matter to the employer, so that he may realise his liability, if keen competitive tenders are required.

An interesting case on this point was decided in 1877, known as Waghorn *v.* The Wimbledon Local Board.

The defendants, a Burial Board, by resolution, instructed R., their architect, to prepare plans and get tenders for a cemetery chapel. R. employed the plaintiff, a quantity surveyor, to take out quantities ; the work went to tender, but none being accepted the plaintiff sued the defendants, who set up that they never authorised R. to employ the plaintiff, and that as a corporation they must contract under seal.

Manisty, J., ruled that as the defendants had instructed R. to get tenders they impliedly authorised him to get quantities taken out, and overruled the objection as to the necessity of sealing ; the plaintiff had judgment.

The plaintiff, Mr. Joseph Waghorn, is a " quantity surveyor." The defendants are, by statute, the Burial Board, as well as the Local Board, for the district of Wimbledon. In 1875 they instructed their salaried surveyor, Mr. Rowell, to prepare plans and specifications, and to procure tenders for the erection of a cemetery chapel. These instructions were embodied in a resolution passed at a meeting of the Board. When Mr. Rowell had prepared the plans, he instructed the plaintiff to take out the " quantities," and he advertised for tenders in *The Builder*. Several builders sent in tenders, having used the quantities taken out by the plaintiff in arriving at their estimates. The defendants did not accept any of the tenders, the amount of the lowest being higher than the sum which they intended to expend.

The case for the defendants was that they never authorised Mr. Rowell to employ the plaintiff to take out the quantities. Several architects and surveyors were called for the plaintiff, who stated that the business of a quantity surveyor was quite distinct from that of an architect, and that it was necessary that the quantities should be taken out to enable the builders to tender. They also stated that the custom was for the builder, when sending in a tender, to add the charges of the quantity surveyor to his estimate, and that if the tender was accepted he paid the quantity surveyor. If, however, none of the tenders were accepted, the building owner was liable to pay the quantity surveyor's charges.

At the end of the plaintiffs case, it was submitted that there was no evidence that the defendants had authorised Mr. Rowell to employ the plaintiff to take out the quantities.

Manisty, J., ruled that as they had instructed him to procure tenders, and as tenders could not be made without quantities, they had impliedly authorised him to get the quantities taken out.

It was then submitted that the defendants, being a corporation, could only contract under seal, and there being no contract under seal here, the plaintiff could not recover.

Manisty, J., ruled that as the defendants had by resolution impliedly authorised Mr. Rowell to get the quantities taken out and had the benefit of the work which had been done, their objection was not tenable.

Judgment was according entered for the plaintiff for the amount claimed (£170 19s. 10d.).

Obituary

J. B. EVERARD [*F.*].

Mr. Everard, who was elected a Fellow in 1888,* died at Leicester on 13 September. He was also a Fellow of the Surveyors' Institute, of the Geological Society, a member of the Institution of Civil Engineers, and of the Mining Institute. Mr. Everard was largely engaged in important engineering schemes, and it was due chiefly to his initiative that the Derwent Valley water scheme was successfully carried out so far as Leicester is concerned, a scheme which involved the construction of a bridge over the Trent. He was a member of the well-known firm of architects, Messrs. Everard, Son and Pick, who carried out many important architectural works, including the Leicestershire and Rutland Counties Asylum at Narborough, the Leicester Technical and Art Schools, and the remodelling of the Leicester Royal Infirmary.

Mr. Everard had been High Sheriff of Leicestershire and occupied other honourable positions in public life. He was seventy-eight years of age.

Allied Societies

READING SOCIETY OF ARCHITECTS.

The Reading Society of Architects has arranged in conjunction with the Reading Branch of the Workers' Educational Association an unusually interesting course of four lectures, which in their sequence broadly cover the history of architecture from Greek to modern times. The series of lectures and lecturers is as follows :

24 *October*—" The Greek Point of View," Mr. Ronald P. Jones, M.A. [*F.*].

7 *November*—" The Roman Point of View," Mr. Paul Waterhouse, M.A., P.P.R.I.B.A.

21 *November*—" The Mediæval Point of View," Major H. C. Corlette, O.B.E. [*F.*].

5 *December*—" The Renaissance and Modern Point of View," Mr. W. E. Vernon Crompton [*F.*].

THE R.I.B.A. AND THE ALLIED SOCIETIES OVERSEAS.

The close sympathy which exists between the Institute and the allied societies is expressed in the following extracts from letters received in answer to Mr. Waterhouse's letter published in the JOURNAL of 18 August.

Mr. G. T. Hurst, the Past President of the Natal Institute of Architects, writes :—

" In our much smaller sphere my experience has been closely parallel with yours as regards a broadening and deepening conception of the real fraternity of the allied bodies as of the individual members of the profession, whether in the homeland or scattered over the Empire, and of all that that connoted."

Mr. C. Reginald Ford, the Past President of the New Zealand Institute of Architects, writes :—

" Architects in New Zealand, like all their fellow-countrymen, are imbued with a love of England, but, perhaps because of their calling, which makes them more fully

* Mr. Everard retired in 1911.

conscious of their immeasurable debt to the mother country, that love is particularly deep and real.

"That our organisation may come into closer union as the years pass, alike to aid in the advancement of our art and to strengthen the bonds of Empire, is, I am sure, the wish of all members of the New Zealand Institute."

R.I.B.A. PREMISES.

It was hoped to complete the rebuilding of the R.I.B.A. Galleries and other alterations before the opening of the session, but unforeseen difficulties have arisen which will delay the completion until the end of December. Arrangements are being made for holding the examinations in November and December at other premises.

Through the generous hospitality of the Royal Society of Medicine, the R.I.B.A. General Meetings in November and December will be held in the Barnes Hall of the Royal Society of Medicine, No. 1, Wimpole Street, W.1. Members are particularly requested to note the address.

The Inaugural Meeting, which will be opened by the President's Address, will be held at the Royal Society of Medicine at 8.30 p.m. on Monday, 5th November. On this occasion the portrait of Mr. Paul Waterhouse, Past-President, which has been painted by Sir William Orpen, R.A., will be unveiled and presented to the Royal Institute, and the Medal for the year 1922, which was awarded to Mr. W. Curtis Green, A.R.A., for Wolseley House, Piccadilly, will be presented to Mr. Curtis Green.

THE POLICY OF THE R.I.B.A.

The Council have appointed a Charter and By-Laws Committee for the purpose of considering and advising the Council upon the revision of the Charter and By-laws.

This Committee has also been directed to consider the question of the general policy of the R.I.B.A., to explore the existing situation, and to submit a report to the Council upon it at the earliest practicable date.

The Committee consists of the following members :

Mr. J. Alfred Gotch, President.

Major Harry Barnes, Mr. H. T. Buckland, Mr. E. Guy Dawber, Mr. W. Curtis Green, A.R.A., Vice-Presidents.

Mr. Arthur Keen, Hon. Secretary.

Mr. Herbert A. Welch, A.R.I.B.A.

BOARD OF ARCHITECTURAL EDUCATION. R.I.B.A. INTERMEDIATE EXAMINATION. NOVEMBER, 1923.

The centres for this examination will be London and Leeds. At both centres the examination will be held from 23 to 27 November 1923, inclusive.

At the London centre the oral examination will be held on 29 November; at the Leeds centre on 28 November.

MR. BRANFORD'S SOCIOLOGICAL STUDIES.

The forthcoming publication of a book entitled *Science and Sanctity : a Study in the Scientific Approach to Unity* (London, Leplay House Press), by Mr. Victor Bransford, will be a matter of considerable interest to all those who are interested in the Civic Survey movement as a basis of schemes for Town Planning. Mr. Branford's work in the promotion of regional surveys in connection with the Sociological Society is well known, and the elaboration of his theories, to which several chapters in the book are devoted, will attract the attention of all thoughtful students of sociology and its relation to the practical development of our towns and cities.

PUBLIC LECTURES ON ARCHITECTURE.

Sir Banister Fletcher [*F.*] is giving a course of twenty-four lectures on "Ancient Architecture," on Wednesdays at 6 p.m., at the Central School of Arts and Crafts, Southampton Row, W.C.

Miss Margaret Murray, F.S.A., is giving a course of twelve lectures on "Ancient Egypt," at the British Museum, on Tuesdays, at 4.30.

Miss Claire Gaudet is also giving a course of lectures at the British Museum on Thursdays at 4.30, in the Lecture Room, on "Recent Excavations in Mesopotamia, Egypt and the Mediterranean, showing the Evolution of Architecture from the 4th Millennium B.C. to Roman and Early Christian Times."

FORTHCOMING PUBLICATIONS.

Messrs. B. T. Batsford's list of autumn announcements includes : *English Decoration and Furniture During the Late Tudor and Early Stuart Periods*, by M. Jourdain—the concluding volume on the earliest period of the four in *The Library of Decorative Art*, completing the story from 1500–1820 ; *The Decorative Arts in England During the XVIIIth Century*, edited by H. H. Mulliner ; *A History of Ornament*, by Professor A. D. F. Hamlin—the second and concluding volume on the Renaissance and Modern Styles ; *The Significance of the Fine Arts*—a volume embracing sections on Architecture, Sculpture, Fine and Applied Arts, and Music, by various writers, issued under the direction of the Committee on Education of the American Institute of Architects ; *A Guide to English Furniture Styles from Tudor Times to the Regency*, by J. T. Garside, Lecturer on Furniture History at the Polytechnic Institute—the first section on the Tudor, Elizabethan and Jacobean styles ; *Everyday Life in Prehistoric Times*, by Marjorie and C. H. B. Quennell ; *The Human Form*, illustrated from studies by F. R. Yerbury, with an introduction on its application in Decorative Art past, present, and possible, by G. Montague Ellwood ; *The Story of the Art of Building*, by P. Leslie Waterhouse, M.A. [*F.*], re-modelled and re-illustrated ; *Old English Household Life*—an account of some of its aspects and fittings, by Gertrude Jekyll ; *Applied Drawing*, pictorial, decorative, mechanical, by H. H. Brown, with chapters by various authorities on art.

Messrs. Ernest Benn, Ltd., announce the forthcoming publication of a series of books to be published under the generic title Masters of Architecture, edited by Stanley C. Ramsey [*F.*]. Each volume will be illustrated by some thirty to thirty-five photographs, preceded by a written introduction or appreciation by a well-known architect who has made a particular study of his subject. The following volumes are in active preparation : *Inigo Jones*, by Stanley C. Ramsey, F.R.I.B.A. ; *Hawksmoor*, by H. S. Goodhart-Rendel ; *Vanbrugh*, by Christian Barman, editor of *Architecture* ; *Chambers*, by Trystan Edwards, M.A. [*A.*] ; *Bentley*, by W. W. Scott-Moncrieff, M.C. [*F.*] ; *McKim*, by C. H. Reilly, O.B.E., M.A. [*F.*]. The same publishers also announce the forthcoming publication of the first volume of *The Theory and Elements of Architecture*, by Robert Atkinson [*F.*], Director of Education at the A.A. School of Architecture, and Hope Bagenal [*A.*], Librarian of the A.A.

Mr. Arthur Geo. Warnham Tickle [*F.*], has been appointed Secretary to the Commissioners conducting the enquiry "as to what measures are possible to increase the quantity and decrease the cost of housing accommodation in the Colony of Hong-Kong."

Notices

THE OPENING GENERAL MEETING.

The First General Meeting (Ordinary) of the Session 1923-24 will be held on Monday, 5 November 1923, at 8.30 p.m., in the Hall of the Royal Society of Medicine, No. 1 Wimpole Street, Cavendish Square, W.1, for the following purposes :—

To read the Minutes of the Sixteenth General Meeting of the Session 1922-23, held on 25 June 1923; formally to admit members attending for the first time since their election.

To read the names of candidates nominated for election on 3 December 1923.

Mr. J. Alfred Gotch, F.S.A. (President), to deliver the Inaugural Address of the Session and to unveil and formally present the portrait of Mr. Paul Waterhouse, Past President, painted by Sir William Orpen, R.A.

To present the R.I.B.A. Medal and Diploma for the Best London Street Frontage 1922, to Mr. W. Curtis Green, A.R.A.

Competitions

CHISWICK RIVER EMBANKMENT AND PROMENADE, AND EASTLEIGH NEW ASSEMBLY HALL AND EXTENSIONS TO COUNCIL HALL.

Members and Licentiates of the Royal Institute of British Architects must not take part in the above competitions because the conditions are not in accordance with the published regulations of the Royal Institute for architectural competitions.

IAN MACALISTER,
Secretary.

HOLMSIDE AND SOUTH MOOR COLLIERIES : COTTAGE HOSPITAL.

The President of the Royal Institute of British Architects has nominated Mr. T. R. Milburn, F.R.I.B.A., as Assessor in this Competition.

Election of Members

3 December, 1923.

The following applications for election have been received. Notice of any objection or other communication respecting the candidates must be sent to the Secretary for submission to the Council prior to Monday, 5 November 1923.

AS FELLOWS (21).

ALLNER : JAMES [*A.* 1909], 91 High Street, Poole ; Kingscote, Sterte, Poole.

CONDER : ALFRED ROWLAND, P.A.S.I. [*A.* 1902], 42 Cecile Park, Crouch End, N.8.

DRYSDALE : GEORGE [*A.* 1911], 17 Buckingham Street, Adelphi, W.C.2 ; 18 Horbury Crescent, Notting Hill Gate, W.

FRANCIS : ERIC CARWARDINE [*A.* 1915], St. Tewdric, near Chepstow.

GODWIN : WILLIAM HUBERT [*A.* 1914], Bank Buildings, Kidderminster ; Dowles, Bewdley, Worcestershire.

GREENAWAY : FRANCIS HUGH [*A.* 1891], Parliament Mansions, Victoria Street, S.W.1 ; 34 Ladbroke Gardens, Notting Hill, W.11.

HATCHARD-SMITH : WILLIAM HORNBY [*A.* 1914], 11 Haymarket, S.W.1 ; Charlwood, Epsom.

HEPWORTH : PHILIP DALTON [*A.* 1912], 7 Gray's Inn Place, W.C.1 ; 30 South Eaton Place, S.W.

HILL : OLIVER [*A.* 1921], 23 Golden Square, W.1 ; 19 West Eaton Place, S.W.1.

HUTT : HARRY [*A.* 1895], 164 Friar Street, Reading ; 29 College Road, Reading.

MARKHAM : JOHN HATTON [*A.* 1905], " Elmside," Marlborough Hill, Harrow.

MARSHALL : CHARLES JOHN [*A.* 1887], Balvaird, Burdon Lane, Cheam, Surrey.

MAYSTON : ARTHUR RICHARD [*A.* 1891]. 49 Chiswell Street, E.C.1 ; 57 Church Crescent, Church End, Finchley, N.3.

MORTON : RALPH HENRY [*A.* 1898], North-Eastern Bank Chambers, South Shields ; Westoe, South Shields.

NEWBERRY : JOHN ERNEST [*A.* 1889], Parliament Mansions, Victoria Street, S.W.1 ; 1, Flanders Road, Bedford Park, W.4.

NEWTON : WILLIAM GODFREY, M.C., M.A.(Oxon.) [*A.* 1913], 4, Raymond Buildings, Gray's Inn, W.C.; 11 Gray's Inn Square, W.C.

SHARP : ANDREW [*A.* 1902], 73, King Street West, Toronto ; 296 Avenue Road, Toronto, Canada.

SULLIVAN : LEO SYLVESTER [*A.* 1908], 158 Fenchurch Street, E.C.3 ; " Barrow," 5 Montana Road, Wimbledon, S.W.20.

UNSWORTH : GERALD, M.C. [*A.* 1920], 38 Sackville Street, W.1 ; Shirklars, Petersfield.

WILSON : GEOFFREY CECIL [A. 1910], Bank Chambers, 32 Strand, W.C.2 ; 6 Brent Villas, Hendon, N.W.4.

WOOD : DOUGLAS, O.B.E.(Mil.), F.S.I. [*A.* 1902], 25 Sackville Street, W.1 ; " Hawthorndene," Gordon Avenue, Stanmore.

AS ASSOCIATES (31).

ALEXANDER : THOMAS MACKELVIE [Special Examination], 6 Prince Alfred Road, Wavertree, Liverpool.

BILLIMORIA : HOMI FRAMJEE, B.Arch.(Liverpool) [Passed five years' course at Liverpool University School of Architecture—Exempted from Final Examination after passing Examination in Professional Practice], Station Avenue, Wellawatta, Colombo, Ceylon.

BLACK : KENNETH EASTTY [Special War Examination], 61 Hornsey Lane, Highgate, N.6.

BUCHIA : SHAPURJI NASARWANJI, B.E.(Civil) [Special Examination], Dady House, Wadia Street Corner, Tardeo, Bombay, India.

BUSH : SYDNEY POYNTZ [Special War Examination], Assistant Government Architect, Public Works Department, Secretariat, Rangoon, Burma.

CLARK : RICHARD JOHN BOND [Final Examination], 24 Lannoweth Road, Penzance.

CLIST : HUBERT ARTHUR [Special War Examination], 10 Westbourne Square, W.2.

DAVIDSON : ARTHUR EDWIN [S. 1914—Special War Exemption], 2,146, Queen Street, E., Toronto, Canada.

DEUCHAR : CHARLES CUNNOLD [Special War Examination], Public Works Department, Union Buildings, Pretoria, South Africa.

DODDINGTON : WILLIAM [Special Examination], 70 Bousfield Road, New Cross, S.E.14.

EALES : WILLIAM HENDERSON [Special War Examination], 26 Blessington Street, St. Kilda, Victoria, Australia.

FEARN : STANLEY WALTER [Special War Examination], 156 Willis Street, Wellington, New Zealand.

FOREMAN : LESLIE ROBERT [Special War Examination], 123 Hollingbury Road, Brighton.

HALL : LESLIE WILLIAM [Special War Examination], 8 Leggatts Way, Watford, Herts.

HALLIDAY : FRANKLYN LESLIF [Special War Examination]. 14 John Dalton Street, Manchester.

HAUGHTON : VIVIAN PALMER [Special War Examination], P.O. Box 406, Wellington, New Zealand.

IGGLESDEN : SIDNEY DIXON [Special War Examination], 23 Constantine Road, Hampstead, N.W.3.

LAWRIE : ALEXANDER FRASER [Passed six years' course at Robert Gordon's Technical College, Aberdeen—Exempted from Final Examination after passing Examination in Professional Practice], 19 Derby Road, Bertrams, Johannesburg, Transvaal, South Africa.

MASEY : RICHARD JAMES [Special War Examination], 20A Maple Road, Anerley, S.E.

MAY : ALBERT JOHN [Special Examination], 31 Allington Road, Southville, Bristol.

MILLIGAN : THOMAS WILLIAM [Special War Examination], Rhodes Buildings, Cape Town, South Africa.

MOFFAT : JOHN ARTHUR CARTER [Special War Examination] 19 Natal Bank Chambers, Durban, Natal, South Africa.

MONK : SYDNEY GEORGE [Special War Examination], 56 St. Albans Road, N.W.5.

PARHAM : ARTHUR DOUGLAS [Special Examination], Public Works Department, Colombo, Ceylon.

RIDING : RICHARD ARTHUR FIELDING [Special Examination], 57 Longridge Road, Earl's Court, S.W.

ROSS : WILLIAM [Special Examination], 137 West Regent Street, Glasgow.

STERRETT : JOHN EDWIN [Special War Examination], 21, Kenilworth Avenue, Walthamstow, E.17.

TOY : SIDNEY, F.S.A. [Special Examination], 29, Essex Street, Strand, W.C.

TRENGROVE : WILLIAM HENRY [Special War Examination], 140 Hereford Street, Christchurch, New Zealand.

WALKER : HUGH AITKEN HUTCHISON, M.C. [Special War Examination], 909 Church Street, Pretoria, South Africa.

WILSON : JOHN GODDARD [Special Examination], Public Works Department, Union Buildings, Pretoria, South Africa.

AS HON. FELLOW (1).

BURNHAM : The RT. HON. VISCOUNT, C.H., M.A., LL.D., D.Litt., 13 Bryanston Square, W.1.

AS HON. ASSOCIATE (1).

KENYON : SIR FREDERIC GEORGE, K.C.B., M.A., D.Litt., Director and Principal Librarian at the British Museum, W.C.; Kirkstead, Godstone, Surrey.

ELECTION OF MEMBERS, 7th JANUARY 1924.

Associates who are eligible and desirous of transferring to the Fellowship Class are reminded that if they wish to take advantage of the election to take place on the 7th January, 1924 they should send the necessary nomination forms to the Secretary not later than the 10th November.

Members' Column

PARTNERSHIP.

GENTLEMAN required as assistant with a view to partnership in provincial city about two hours north of London. Reply, stating experience, etc., Box 1903, c/o Secretary, R.I.B.A., 9 Conduit Street, London, W.1.

TO LET.

TO LET.—Well-lighted Room in Architect's Suite in Temple; vacant Christmas or earlier; rent, £55 inclusive.—Reply Box 1523, c/o Secretary, R.I.B.A., 9 Conduit Street, W.

MR. HAROLD BURLEIGH.

MR. HAROLD BURLEIGH (A.) has taken an office at 81 London Road, St. Leonards-on-Sea. Telephone: Hastings 1234.

PARTNERSHIP WANTED.

A.R.I.B.A., with small practice, would be glad to hear of an Architect requiring a partner, preferably in London, or a Chief Assistant, with a view to partnership.—Apply BOX 1203, R.I.B.A., 9 Conduit Street, W.

CHANGES OF ADDRESS.

MR. EDWIN WILLIAMS (A.) has changed his address from 201 Edge Lane to 113 Grove Street, Liverpool.

MESSRS. PERCY TUBBS, SON AND DUNCAN have changed their address from 10, Gray's Inn Square, W.C.1, to No. 30, John Street, Bedford Row, W.C.1. Telephone: Museum 5809.

ON and after October 7th the address of Messrs. Easton and Robertson will be 36, Bedford Square, London, W.C.1. Telephone: Museum 6424.

MR. H. W. PARNACOTT.

MR. H. W. PARNACOTT announces that he is continuing to practise, on his own account, at Members' Mansions, 36, Victoria Street, Westminster, S.W.1. The firm name is H. W. Parnacott, A.R.I.B.A., Architect.

DISSOLUTION OF PARTNERSHIP.

THE partnership existing between Charles James Hair and Ernest Bird in the business of Architects and Surveyors at 23, Portland Terrace, Southampton, has been dissolved. All debts owing by the late firm will be paid by Mr. Hair, who will in future carry on business at 23, Portland Terrace, Southampton. Ernest Bird will practise at 11, Portland Street, Southampton.

APPOINTMENTS WANTED.

ARCHITECT'S ASSISTANT shortly disengaged, at present assisting M.S.A., A.R.I.B.A., City Architects. Sketch plans, working drawings, details, measuring existing buildings, levelling, draft specifications, etc., with good general office routine. Reply Box 8023, c/o Secretary R.I.B.A., 9, Conduit Street, W.1.

EXPERIENCED ARCHITECT, with offices in the West Central district, is willing to help other architects. Sketch Designs, Working Drawings, Details, Specifications, etc.—Apply Box 1400, c/o Secretary, R.I.B.A., 9 Conduit Street, W.

REQUIRED by Licentiate, engagement in London district. Domestic work a speciality. Recently practising in town and could introduce work. Moderate salary.—Box 2883, c/o Secretary, R.I.B.A., 9 Conduit Street, London, W.1.

A.R.I.B.A., with varied experience, would undertake work in London or Suburbs on behalf of provincial or Scottish architects, or would be glad to do work in his own office for any London architects who require temporary help.—Apply Box 1603, c/o Secretary, R.I.B.A., 9 Conduit Street, W.

A.R.I.B.A. of experience desires Assistantship with view to Partnership, or would take over existing practice if owner is desirous of retiring from active work.—Apply Box 5312, c/o Secretary, R.I.B.A., 9 Conduit Street, W.

Arrangements have been made for the supply of the R.I.B.A. JOURNAL (post free) to members of the Allied Societies who are not members of the R.I.B.A. at a specially reduced subscription of 12s. a year. Those who wish to take advantage of this arrangement are requested to send their names to the Secretary of the R.I.B.A., 9 Conduit Street, W.1.

Members sending remittances by postal order for subscriptions or Institute publications are warned of the necessity of complying with Post Office Regulations with regard to this method of payment. Postal orders should be made payable to the Secretary R.I.B.A., and crossed.

IAN MACALISTER,
Secretary R.I.B.A.

R.I.B.A. JOURNAL.

Dates of Publication.—1923:—10th, 24th November; 8th, 22nd December. 1924: 12th, 26th January; 9th, 23rd February; 8th, 22nd March; 5th, 26th April; 10th, 24th May; 7th, 28th June; 12th July; 16th August; 20th September; 18th October.